If you don’t have a dream, how will you ever have a dream come true?

This handbook is dedicated to everyone who has helped the Zithulele dream come true.
First edition: Dec 2008
Second edition: Sept 2009
Third edition: April 2011
Fifth edition: Feb 2013
Sixth edition: Jan 2015
Seventh edition: Jan 2017
Eighth edition: Jan 2018
Ninth edition: Jan 2019
Tenth edition: Jan 2020
Eleventh edition: Jan 2021
Twelfth edition: Jan 2022
TABLE OF CONTENTS

Introduction ............................................................................................................................ 9
  Welcome to the Zithulele Hospital Doctors’ Handbook! .................................................... 9
Core Values ............................................................................................................................ 10
Building A Multi-Disciplinary Team ..................................................................................... 10
The Two Questions ............................................................................................................... 11
Proformas For Clinical Care ................................................................................................. 11

Neonates ............................................................................................................................... 12
  Preterm Neonates .............................................................................................................. 12
  Assessing Physical Maturity of Newborn Infants .............................................................. 13
  Feed and Fluids in Preterm Neonates under 1.5kg ............................................................ 14
  Neonatal Analgesia ............................................................................................................ 15
  Neonatal Sepsis .................................................................................................................. 16
  Normal Neonatal Blood Values ......................................................................................... 17
  Cannulating the Umbilical Vein ....................................................................................... 18
  Neonatal Encephalopathy ................................................................................................. 19
  Seizure Management in Neonates ...................................................................................... 21
  Neonatal Hypoglycaemia ................................................................................................. 22
  Neonatal Jaundice ............................................................................................................... 23
  nCPAP ................................................................................................................................. 26
  Bubble “Bush” CPAP Set Up ............................................................................................. 27
  Infants Exposed to Syphilis in Utero .................................................................................. 28

Paediatrics ............................................................................................................................. 29
  Growth Charts .................................................................................................................... 29
  Malnutrition ......................................................................................................................... 33
  Social Challenges: Helping Paediatric Patients ................................................................. 34
  Milestones of Child Development ..................................................................................... 35
  Diarrhoea & Vomiting in Children ..................................................................................... 37
  Paraffin Ingestion ............................................................................................................... 40
  Reminders Re Normal ........................................................................................................ 40
  Body Surface Area Calculation .......................................................................................... 40
  Post-Streptococcal Glomerulonephritis .......................................................................... 41
  Chronic Childhood Asthma ................................................................................................. 43
  Burns ................................................................................................................................. 46
  First Time Convulsions in Children .................................................................................... 49

Maternal Health ..................................................................................................................... 50
  Cervical Cancer Screening ............................................................................................... 50
  Infertility: A Very Basic Approach ................................................................................... 52
  Amenorrhoea: A Basic Approach ...................................................................................... 52
  Abnormal Uterine Bleeding: A Basic Approach ................................................................. 53
  Menopause: A Basic Approach ......................................................................................... 53
  Recurrent miscarriage: First steps ....................................................................................... 53
ARV Start Visit – Important Pointers .............................. 102
Making ARV Care Better and Safer ................................. 103
HIV Hotline .................................................................... 103
Switching First Line Regimens in Adults ......................... 104
Adjusting HAART in Renal Failure ............................... 105
Virological Failure in Adults ........................................... 106
Drug Interactions with DTG ............................................ 107
Common ARV Drug Toxicities and Side-Effects ............... 108
Reminder About Nevirapine ............................................ 110
Common Opportunistic Infections (And Some Side-Effects) 111
Cryptococcal Meningitis (CCM) ..................................... 113

Tuberculosis ...................................................................... 116
Infant Exposed to TB in Utero ....................................... 116
TB Preventative Therapy ............................................... 117
TB Preventative Therapy in HIV Positive Children .......... 118
TB Preventative Therapy in HIV Positive Adults & Adolescents 119
TB Preventative Therapy in High Risk situations ............... 120
TB Definitions ............................................................... 121
Diagnosing TB in Children ............................................. 122
Treating TB in Children .................................................. 124
TB Drug Doses in Children ............................................. 126
Diagnosing TB in Adults .................................................. 127
Adult TB – Difficult Diagnosis Algorithm ......................... 128
Admitting TB Patients .................................................... 129
Extra-Pulmonary TB (EPTB) ........................................... 130
Adult DS-TB Drug Doses ................................................ 133
Timing of HAART in TB ................................................ 133
Monitoring of Patients on TB Treatment ......................... 133
TB Defaulters ............................................................... 134
TB Drug Side Effects ...................................................... 135
Drug-Induced Liver Injury (TB-DILI) ............................ 136
Skin Reactions Secondary to TB Drugs .......................... 137
Drug Resistant TB ........................................................ 138
Treatment of DR TB in children .................................... 143
DRTB Drugs and doses .................................................. 144
ECGs and BDQ ............................................................ 148
Drug Resistant TB exposure ......................................... 149

Non-Communicable Diseases ......................................... 150
DKA ............................................................................. 150
Diabetes ......................................................................... 151
Status Epilepticus .......................................................... 154
Epilepsy ......................................................................... 155
Hypertension ................................................................. 158
Contents

Autoimmune diseases ........................................ 160
Erectile dysfunction .......................................... 161

Psychiatry........................................................................ 162
Brief Psychiatric Assessment ................................ 162
Aggressive and Disruptive Behaviour .................. 164
Depression ................................................................. 165
Anxiety ........................................................................ 166
Schizophrenia & Psychoses ....................................... 168
Bipolar Mood Disorder (BPMD) ............................ 171
Suicidality ..................................................................... 173

Miscellaneous Clinical (Adults and Children) .......... 174
Who can Consent ......................................................... 174
Basic Fracture Management .................................. 175
Common Fracture Types ........................................... 176
The Angle on Ortho .................................................... 178
Head Injuries .............................................................. 179
C-spine injuries .......................................................... 180
Maxillofacial Imaging .................................................. 182
Crush Syndrome ........................................................ 183
Appendicitis – Have You Considered Antibiotics? .... 185
Constipation ................................................................. 186
Malaria ........................................................................ 187
Rabies .......................................................................... 189
Typhoid Fever ............................................................. 190
Normal CSF Values ....................................................... 190
Traditional circumcision .......................................... 191
Dermatology – Some Common Skin Conditions .... 192
Otitis Media ................................................................. 196
Removing Foreign Bodies From The Ear ............... 200
Primary Eye Care ........................................................ 201
Sexual Assault .............................................................. 207
Palliative Care ............................................................. 208
Blood Transfusions ..................................................... 210
Blood Transfusion formula for Children ............... 211
Improvised Adult CPAP ............................................. 212
Notifiable Medical Conditions ............................... 213
Technology: Some Useful Apps And Clinical Decision Tools 214

Pharmacy and Therapeutics ........................................ 215
Basic Antibiotic Guide ............................................... 215
“Special Antibiotics” .................................................. 219
Adverse Drug Reactions ............................................ 219
Reminders About Cetriaxone and Cefotaxime ....... 220
Paediatric Prescribing: Some Pointers ................. 221
<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Anaesthesia: A Very Basic Guide</td>
</tr>
<tr>
<td>Safe Spinal Anaesthesia</td>
</tr>
<tr>
<td>Safe Sedation Reminders</td>
</tr>
<tr>
<td>Sedation for the intubated patient</td>
</tr>
<tr>
<td>Adrenaline infusion</td>
</tr>
<tr>
<td>Poisoning: Tank Pills</td>
</tr>
<tr>
<td>Poisoning: Amitraz</td>
</tr>
<tr>
<td>Poisoning: Gastric lavage and charcoal</td>
</tr>
<tr>
<td>Poisoning: Hotlines</td>
</tr>
<tr>
<td>Anti-Coagulation</td>
</tr>
<tr>
<td>Iron Made Easy!</td>
</tr>
<tr>
<td>Which Dressing When?</td>
</tr>
<tr>
<td>“Needlestick” Protocol</td>
</tr>
<tr>
<td><strong>Other Useful Information</strong></td>
</tr>
<tr>
<td>Laboratory Tests</td>
</tr>
<tr>
<td>Tumour marker refresher</td>
</tr>
<tr>
<td>Disability Grants</td>
</tr>
<tr>
<td><strong>Referrals</strong></td>
</tr>
<tr>
<td>Doctor’s Guide to Physio and Occupational Therapy</td>
</tr>
<tr>
<td>Referrals to Audiology and Speech Therapy</td>
</tr>
<tr>
<td>Referrals to Dieticians</td>
</tr>
<tr>
<td>Arranging an Emergency Ambulance</td>
</tr>
<tr>
<td>Arranging “The Balloon” (The Helicopter)</td>
</tr>
<tr>
<td>EMS Escalation plan</td>
</tr>
<tr>
<td>Booking the Patient Transport Vehicle</td>
</tr>
<tr>
<td>Referring Children</td>
</tr>
<tr>
<td>Adult Referrals to NMAH</td>
</tr>
<tr>
<td>Optometry – Grace Vision Zithulele</td>
</tr>
<tr>
<td>Psychiatry &amp; Psychology Referrals</td>
</tr>
<tr>
<td>Orthopaedic Referrals</td>
</tr>
<tr>
<td>Jabulani Patient Assistance Fund</td>
</tr>
<tr>
<td>Mentor Mothers Zithulele (MMZ)</td>
</tr>
<tr>
<td>Quick Reference – Useful Numbers in One Place</td>
</tr>
<tr>
<td>Hospital Contact Details</td>
</tr>
<tr>
<td><strong>Acknowledgements</strong></td>
</tr>
<tr>
<td><strong>Disclaimer</strong></td>
</tr>
</tbody>
</table>
Introduction

Welcome to the Zithulele Hospital Doctors’ Handbook!

Rural medical practice is fun and rewarding, but it can also be challenging, even intimidating. Patient and disease profiles may differ from where you’ve previous practiced and the resources available to meet what can seem like an overwhelming need may be limited – and rather different to what you’re used to.

As part of our passion to provide clinical services of the highest quality, despite the remote location, we started developing what is now the Zithulele Hospital Doctors’ Handbook. It’s intended as a practical tool that we hope will help by collating in one place clinical protocols for common and important conditions encountered in a rural setting. The intention is not to replace textbooks or the STGs, but rather to bring together in one place the most important guidelines, reminders and nuggets of wisdom not easily found elsewhere.

In medicine there is seldom only one way to do things. Many rural areas differ markedly from the rural Eastern Cape, where we are situated. Feel free to adapt them to your situation. To the best of our ability, we have tried to ensure that everything in here is up to date, reflects best practice for our context and is practical to implement. Rural medicine should never be second best!

At Zithulele, we also use the Handbook to help us standardise practice between our doctors. We find this helps improve the overall standard of care and reduces confusion among both doctors and nurses. You may like to do the same, depending on your hospital and the size of your team.

If you would like any information about orientation to practical admin things, or clinical proformas to make implementing some of these protocols a bit easier, or if you have any suggestions for future editions please do get in touch. (We have deliberately not included Covid19 management yet as it’s still changing too much.)

Dr Benjamin Gaunt
Clinical Manager
Zithulele Hospital
ben@zithulele.org
December 2021
Core Values

Putting effort into developing an organisation culture focussed on the right things isn’t “warm and fuzzy.” It’s probably the best investment you can make towards making a hospital the kind of place you’d be happy to come to as a patient.

Our Core Values help us articulate what it is we’re doing here – and more importantly, how we intend to do it.

1. **Prioritising patient care**
   Providing care with compassion and respect for patients, connecting with their humanity

2. **Multi-disciplinary teamwork**
   Valuing interdependence as we share responsibility for patient care in a non-competitive environment

3. **Respectful relationships**
   Communicating respectfully in an open and honest, but constructive way with our colleagues, focussing on recognising and encouraging their strengths

4. **Providing quality care**
   Delivering accessible, high standard care that is strategic, well planned and acknowledges rural and rationing realities

5. **Continual learning**
   Seeking to learn continually from each other and the community, and stay up to date with relevant health research and developments

6. **A hopeful attitude**
   Looking for the positive in challenging situations and encouraging each other to avoid cynical talk

Building A Multi-Disciplinary Team

It’s Core Value #2, but deserves special mention. We think time spent motivating for and supporting our allied health colleagues reaps benefits for teams and patients.

We believe strongly in the value of the different clinical skills that each discipline brings to the team. Be proactive about engaging each other actively to enrich your own experience, but more importantly to maximise the benefit your patient will get from their care. This is reflected too in a “flat hierarchy” where team members are regarded as equals and treated as such.
The Two Questions

If you are new to rural medicine, there are two questions you should start asking your patients, today.

- Where do you come from?
- How did you get here today?

The answers to these two questions will give you more information than you expect about the nature and severity of the presenting complaint and the underlying diagnosis. They will also radically alter your management plan. Try it!

I can’t help including a few others of our favourites for providing care and “surviving” rural:

- Is this care good enough for me? (Context is assumed. Are we doing the best we can and making appropriate decisions?)
- Are we getting better? (We’ll never be perfect, but we can try to get better every day.)
- Is this battle worth fighting now? (Most systems need fixing, but not all battles are worth it. Choose wisely.)
- Is that the name in your ID? (Helps massively with medico-legal paperwork and new moms getting birth certificates in the right name!)

Proformas For Clinical Care

At Zithulele we have developed several proformas to aid the implementation of the protocols in this Handbook. Good paperwork can aid good care (but too much can be overwhelming). Please ensure you are aware of the following:

Blood transfusion paperwork
Crush syndrome prevention
Cryptococcal meningitis in-patient management
DKA management
DVT risk assessments
Falls risk assessment
Induction of labour
Malnutrition in-patient management
Maternity (have I remembered everything important) discharge summary
MDR TB - Admission check sheet
MDR TB - Prescription chart
Neuro observations
Oxytocin infusion
Paediatrics (have I remembered everything important) discharge summary
SATS triage charts
SATS triage patient scoring sheets
Surgical safety checklist (adapted)
Neonates

Preterm Neonates

Remember: The less we poke and prod the longer they live!

1. Temperature control
   a. If weight < 1.4kg - incubator (use temperature guide below)
   b. If weight > 1.4kg & suckling well or able to cup feed - full time KMC
   c. Monitor temperature 4-6 hrly
   d. Aim for skin temp 36.2°C -36.8°C

   Incubator temperature guide:

<table>
<thead>
<tr>
<th>Age</th>
<th>&lt;1200g (±0.5°C)</th>
<th>1200g-1500g (±0.5°C)</th>
<th>1500g-2500g (±1°C)</th>
<th>&gt;2500g (±1.5°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-24hrs</td>
<td>35</td>
<td>34</td>
<td>33</td>
<td>32.5</td>
</tr>
<tr>
<td>24-96hrs</td>
<td>34.5</td>
<td>33.5</td>
<td>32.3</td>
<td>32.0</td>
</tr>
<tr>
<td>4-14days</td>
<td>33.5</td>
<td>32.1</td>
<td>30.0</td>
<td></td>
</tr>
<tr>
<td>2-4-weeks</td>
<td>32.8</td>
<td>31.6</td>
<td>30.0</td>
<td></td>
</tr>
<tr>
<td>4-6-weeks</td>
<td>32.0</td>
<td>30.8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Monitoring
   a. Clinical assessment is key
      i. Take time to examine the neonate carefully daily, with as little handling as possible
         i) Keep hands clean! (And encourage nurses & mom to do likewise!)
      ii. The acronym WATCH is helpful: Weight, Abdomen, Temperature, Colour, HGT (where applicable)
      iii. Pay attention to their colour and activity level
      iv. Look for abdominal distension and ask about vomiting
         i) If abdominal distension is present, decrease feeds and treat for sepsis as indicated
   b. Monitor temperature as above
   c. Monitor oxygen saturation if resources available in all infants. Prioritize those with respiratory distress and apnoea. Try keep one probe for each neonate where possible.
   d. Invasive monitoring should have a specific clinical reason:
      i. HGT monitoring: If on IVI fluids > 50% of input then once daily. Increase frequency if baby of diabetic mom, septic, IUGR, hypothermia, previous hypoglycaemia until stable.
      ii. Bloods investigations
         i) Do FBC if history of cord not clamped, deep jaundice etc
         ii) Do CRP only after 2 days antibiotics if septic
3. **Fluids and feeds**
   a. See separate guidelines for fluid and feed management for neonates. Note: there are separate fluid tables for babies < 1kg and those > 1kg

4. **Antibiotics**
   a. See Neonatal Sepsis protocol.
   b. Effectively, in preterm infants, start antibiotics if there is any other risk.

5. **Prevention of Apnoeas**
   For any baby with birth wt < 1.5kg AND < 32/40
   a. Caffeine should be used as first choice:
      i. Loading dose 20mg/kg
      ii. Maintenance 5-10mg/kg daily
      iii. Give ORALLY
      iv. Stop when at 32 weeks corrected gestational age and apnoea free
   b. Aminophylline is second choice:
      i. Loading dose 5-6 mg/kg
      ii. Maintenance dose 2.5 mg/kg/dose 12hrly
      iii. Use ORALLY only
      iv. Remember to increase dose with increasing weight
      v. Stop when at 32 weeks corrected gestational age and apnoea free
   c. Continuous SpO\textsubscript{2} monitoring if possible. Aim for sats between 88-92%
   d. Emphasize response to desaturations by nursing staff

6. **Vitamin and iron supplementation**
   a. Vidaylin 0.6 ml/day starting after first week (This can be omitted if on FM85 fortified feeds, but will be needed again once fortification stops.)
   b. Ferrodrops 0.3ml/day after 3-4 weeks.
   c. NB Remember to prescribe as TTO on discharge

**Assessing Physical Maturity of Newborn Infants**

The Ballard score (with pictures) has been incorporated in our Neonatal Admission Case sheet (and it’s in the textbooks). *All babies with gestational age unknown or less than 37 weeks must have Ballard score within 24 hours of birth unless they had an early ultrasound dating scan before 20 weeks.*
**Feed and Fluids in Preterm Neonates under 1.5kg**

**First principle:** Providing the correct volume of fluid every day, at the correct rate, is probably the most important thing we can do to maximise survival in very small neonates (esp < 1kg!)

**Second principle:** Start feeds early and build up quickly.

Practically, this means:

**Introduce feeds immediately**

*Who is Day 0 and who is Day 1?*

The ensure that everyone is on the same page, please consider the first calendar day of life as Day One when the baby is born before 12h00. If the baby is born between midday and midnight, consider that Day Zero, with the following day as Day One.

**Day 1**
- 24ml/kg/day (1ml/kg/hr) expressed breast milk using syringe driver if possible but change the syringe every 6 hours (otherwise hourly NGT feeds)
- If no breast milk on day 1, start feeds on D2
  - Need to work with mom from time of delivery to help her produce milk!
  - Avoid formula – it increases the risk of NEC
- Use IV fluids for the balance (see below)

**Day 2 onwards**
- Increase feeds by 24ml/kg/day
  - On day 2, therefore, give 2ml/kg/hour
- Increase up to a maximum of 150ml/kg/day until they are getting full daily volume as breast milk.
- Use IV fluids for the balance (see below)

**Use IV fluids to make up the balance**
- The total fluid requirement per day is shown in the table below.
- Use Neonatalyte as IVI fluid
- If HGT consistently > 8 then change to 5% solution (add 10mls 50% dextrose to every 90mls 0.9% Saline)
- Use a syringe driver to deliver the fluids

**Table:** Total daily fluid requirement per day of life if < 1kg

<table>
<thead>
<tr>
<th>Day</th>
<th>ml/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 0</td>
<td>90</td>
</tr>
<tr>
<td>Day 1</td>
<td>90</td>
</tr>
<tr>
<td>Day 2</td>
<td>110</td>
</tr>
<tr>
<td>Day 3</td>
<td>130</td>
</tr>
<tr>
<td>Day 4</td>
<td>140</td>
</tr>
<tr>
<td>Day 5</td>
<td>150</td>
</tr>
</tbody>
</table>
Table: Total daily fluid requirement per day of life if > 1kg

| Day 0 | 60 ml/kg |
| Day 1 | 60 ml/kg |
| Day 2 | 80 ml/kg |
| Day 3 | 100 ml/kg |
| Day 4 | 120 ml/kg |
| Day 5 | 140 ml/kg |
| Day 6 | 150 ml/kg |

And then...
- Do not increase daily fluid volume above 150ml/kg/day until they are on full feeds.
- Once on full feeds, increase daily volume slowly to 200ml/kg/day
  - If fortification is not available (FM85) this can be increased to 220ml/kg/day if they are not growing, but this is not ideal.
- If neonate > 1kg, growing well & tolerating feeds, give feeds every two hours
- If neonate > 1.5kg, growing well & tolerating feeds move to 3-hourly feeds?

OTHER HELPFUL HANDY FEEDING HINTS
1. Babies less than 1.4kg:
   a. May need NGT feeds until 34-35/40 corrected age. (Note sucking reflex emerges at 34/40 gestation)
   b. Insertion of NGT- pass 2x length from sternal notch to xiphisternum +2.5cm.
2. If struggling with weight gain once a bit bigger can try:
   a. Restricting breast feeds to 10min each breast
   b. Alternating breast feeding and cup feeding 2hrly
   c. Giving top up feeds after breast feeding. About 1/3 required volume.
3. Feeding intolerance
   a. Exclude or treat infection.
   b. Keep in mind surgical causes
   c. Give smaller feeds more frequently

Neonatal Analgesia
Please make sure that you give ANALGESIA to ALL neonates BEFORE doing ANY invasive procedure. Good analgesia reduces stress, which improves neonatal outcomes.

PLEASE GIVE 50% dextrose orally
<1000g give 0,5ml
>1000g give 1ml

Dextrose in neonates is as effective as morphine!
Please use it before all drips, HGT checks or taking blood!
Neonatal Sepsis

Neonates have little reserve. Actively think about the possibility of sepsis and start antibiotics early if warranted.

1. **When to start?**
   Start antibiotics if two or more of the following are present:
   
   **Antenatal risk**
   - Maternal intrapartum fever ≥38°C or confirmed bacterial infection
   - Clinical diagnosis of chorioamnionitis
   - Spontaneous preterm labour ≤36w GA
   - Confirmed ROM > 18 hours in preterm baby
   - Confirmed prelabour ROM >24 hours in term baby
   - Born before arrival (BBA)

   **Postnatal conditions**
   - Need for extensive CPR
   - Respiratory distress
   - Neonatal encephalopathy
   - Recurrent apnoeas
   - Abnormal heart rate (brady or tachy)
   - Persistent abnormal glucose haemostasis (hypo- or hyper-)
   - Temperature abnormality (>38 or <36) not explained by environment
   - Feeding intolerance, incl vomiting, excessive gastric aspirates and abdominal distension
   - Metabolic acidosis ≥10mmol/l

2. **Workup**
   a. Blood cultures should be done “whenever antibiotics are started” and always when antibiotics are escalated
   b. If clinically indicated, do LP (CSF) and other cultures. Send umbilical catheter of IV cannula tips for culture too if possible.
   c. Do CRP after 48 hours of antibiotics.

3. **Which antibiotics?**
   a. **First line:**
      Use **Benzyl Penicillin** (Pen G) 50000u/kg/dose 12hrly PLUS **Gentamycin** 5mg/kg daily as first line antibiotics.
      If Pen G not available (it’s currently Sect 21), use **Ampicillin** (50mg/kg/dose 12hrly <2kg, 8hrly >2kg).
   b. **Second line**: If not clinically responding to 1st line after 3 days, change to: **Piperacillin/Tazobactam** (50-100mg/kg/dose 12hrly in first week of life, thereafter 6-8 hourly) PLUS **Amikacin** (15mg/kg daily)
      Remember to do a blood culture!
   c. **Third line**, or if recent ESB: **Klebsiella** in unit: **Meropenem** (20mg/kg/dose 12hrly if <32w GA and <2wk old; or 8hrly if >32w GA or >2wk old; 30mg if both >).
4. **When to stop**
   a. Duration of antibiotics should be tailored to clinical response.
   b. In the absence of proven sepsis there is no “course” duration
   c. If the CRP done after 48 hours of antibiotics is normal and no pathogens grown, then stop antibiotics.

**INFECTION CONTROL**
- Wash your hands incessantly.
- No long sleeves, and no arm jewellery other than rings
- Encourage mom to advocate for infection control near her baby
- Keep feeding tubes sterile before insertion
- Change feeding tubes weekly
- Change syringes (for IV infusion or feeds) every 4 hours
- Change giving set (for IV infusion or feeds) every 2 days
- Remove umbilical catheters after 72 hours.

**Normal Neonatal Blood Values**
Table taken from Tygerberg Hospital Neonatology protocol

<table>
<thead>
<tr>
<th>CHEMISTRY</th>
<th>THYROID FUNCTION</th>
<th>HAEMATOLOGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium (mmol/l)</td>
<td>135 - 145</td>
<td>TSH (mU/l)</td>
</tr>
<tr>
<td>Potassium (mmol/l)</td>
<td>3.6 - 6.7</td>
<td>D3-7 &lt;25</td>
</tr>
<tr>
<td>Chloride (mmol/l)</td>
<td>95 - 115</td>
<td>D8-14 &lt;10</td>
</tr>
<tr>
<td>Anion gap (mmol/l)</td>
<td>7 - 18</td>
<td>&gt;D13 0.4 - 4</td>
</tr>
<tr>
<td>Calcium (mmol/l)</td>
<td>1.9 - 2.7</td>
<td>HAEMOGLOBIN (g/dl)</td>
</tr>
<tr>
<td>Magnesium (mmol/l)</td>
<td>0.8 - 1.1</td>
<td>Haematocrit (%)</td>
</tr>
<tr>
<td>Phosphate (mmol/l)</td>
<td>1.6 - 2.8</td>
<td>Red cell count (x10^12/l)</td>
</tr>
<tr>
<td>Glucose (mmol/l)</td>
<td>2.2 - 6.7</td>
<td>MCV (fL)</td>
</tr>
<tr>
<td>Urea (mmol/l)</td>
<td>&lt;D2 2 - 11</td>
<td>Platelets (x10^9/l)</td>
</tr>
<tr>
<td>Creatinine (mmol/l)</td>
<td>&lt;D2 1.8 - 3</td>
<td>Reticulocytes (%)</td>
</tr>
<tr>
<td>Preterm</td>
<td>D2 0.140</td>
<td>Reticulocytes (absolute)</td>
</tr>
<tr>
<td>Term</td>
<td>&gt;D2 30 - 90</td>
<td>RBC (x10^12/l)</td>
</tr>
<tr>
<td>Osmolality (mmol/l)</td>
<td>&lt;D2 40 - 113</td>
<td>WCC</td>
</tr>
<tr>
<td>Protein (g/l)</td>
<td>&gt;D2 15 - 60</td>
<td>Neutrophils (%)</td>
</tr>
<tr>
<td>Albumin (g/l)</td>
<td>270 - 290</td>
<td></td>
</tr>
</tbody>
</table>
FEEDING SUPPLEMENTS / SUBSTITUTES FROM THE DIETICIANS

**FM85**

Indications for use (Note HIV status of mother in decision)
- Breastfed LBW infants not growing at a rate of 15g/kg/day
- Breastfed LBW infants that are fluid restricted

Guidelines for use
- Baby must receive full fluid requirement (150 – 180 ml/kg)
- Day 1: 50% dosage. Day 2: full dosage
- Max dosage: 1 level scoop per 20ml breast milk
- Add directly before feed to single feed volume
- Remember multivitamin drops
- Remember supplemental iron
- NB: fortification STOPS on D/C

If FM85 is out of stock:
- MCT oil (ideal) / canola oil / pure sunflower oil / olive oil can be added to breastmilk instead
- Add 0.4ml to 20ml expressed breastmilk (2% of the volume of the feed)

**Pre-Nan**

Indications for use
- Breast milk is best for all infants, Pre-Nan only to be used in consultation with a medical officer and dietician
- Premature babies / <1.8 kg
- Biliary atresia
- Once baby is feeding well, growing and >2.5kg, change to standard infant formula

**Cannulating the Umbilical Vein**

In general, cannulating a peripheral vein should be your first choice as it has a lower risk of sepsis.

Please remember that this should be a sterile procedure! Otherwise you risk introducing organisms directly into the central blood stream. Make sure you have everything ready for the procedure before you start.

The two arteries and one vein are arranged in the umbilical cord as shown.

The arteries can also be identified by their muscular wall. The distance the cannula should be inserted is 1cm past where you get venous return (withdraw syringe frequently as you insert cannula)
Neonatal Encephalopathy
(previously “Hypoxic ischaemic encephalopathy” or “Birth asphyxia” neither of which are always clinically accurate and both of which carry medicolegal risk)

A special Neonatal Encephalopathy Addendum has been prepared in the Eastern Cape. It should be used in all neonates >36w GA and in whom there is either evidence of intrapartum hypoxia, OR need for resuscitation at birth (Apgar <7 at 5 min), OR evidence of neonatal encephalopathy. The addendum guides management on a day-by-day basis.

Clinical signs
- Lethargy with poor sucking, increased or decreased tone and poor Moro reflex, irritability, fisting, convulsions, full fontanelle and apnoea.
- Use the NE Thompson score to measure the severity of the clinical signs on a daily basis.

Management

Prevention
- Reduce perinatal hypoxia with good antenatal and labour ward care.

Resuscitation
- Prevent post-partum hypoxia by competently resuscitating the baby. Continue oxygen if needed.

Head Cooling
- Assess whether the baby qualifies for head cooling and implement the protocol if s/he does. [This is currently not recommended at District Hospitals]

Convulsions
- DO NOT USE ‘prophylactic anti-convulsants’ (sedation masks neurological signs and has no benefits)
- If baby fits, follow the step wise approach described in the following protocol

Intake
- Initiate IV fluids and keep nil per os for 24 hours (lessens risk of Necrotizing Enterocolitis) and then gradually commence nasogastric feeds and breastfeeding when the baby can suck and swallow
- Restrict fluid intake to 50ml/kg/d in first 24 hours

Observation
- Monitor the HR, RR, temperature, saturation, BP, intake and output 3 hourly, and respond accordingly
- Prevent hyperthermia!! Check that incubator is not set on manual temp regulation.
Investigations
- Send placenta for histology in all cases.
- Do FBC, U&E, CMP and blood culture + LP if any signs of sepsis. Monitor on days as guided by Addendum.
- Monitor abnormalities every 48 hours until normal

MDT referral
- All NE babies should be referred to OT, physio and speech & audiologist early.

Discharge
- Babies may be discharged once they are feeding well, have normal renal function and are stable.

Follow up
- Follow up at 6 weeks and 4 months for neuro-developmental assessment in conjunction with the multi-disciplinary team.

Referral criteria
- Babies with NE should usually be managed locally. It is important to pay attention to supportive care to prevent further deterioration.

Prognosis
- A baby who scores a maximum of 10 or less and is normal by day 7 will usually have a normal outcome. A baby whose score peaks higher than 15 or who remains abnormal after day 7 must have a guarded prognosis.

Folders
- Please ensure that the folders for all babies with NE are handed to the Maternity Area Manager on discharge as these cases all carry high medico-legal risk.

SCORING OF HYPOXIC ISCHAEMIC ENCEPHALOPATHY

Thompson score: Please score babies daily using this chart in the Neonatal Case Sheet

<table>
<thead>
<tr>
<th>Score</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of consciousness</td>
<td>Normal</td>
<td>Hyperalert</td>
<td>Lethargic</td>
<td>Comatose</td>
</tr>
<tr>
<td>Tone</td>
<td>Normal</td>
<td>Hypertonia</td>
<td>Hypotonia</td>
<td>Flaccid</td>
</tr>
<tr>
<td>Seizures</td>
<td>None</td>
<td>Infrequent</td>
<td>Frequent</td>
<td></td>
</tr>
<tr>
<td>Posture</td>
<td>Normal</td>
<td>Fisting, cycling</td>
<td>Strong flexion</td>
<td>Decerebrate</td>
</tr>
<tr>
<td>Moro</td>
<td>Normal</td>
<td>Partial</td>
<td>Absent</td>
<td></td>
</tr>
<tr>
<td>Grasp</td>
<td>Normal</td>
<td>Poor</td>
<td>Absent</td>
<td></td>
</tr>
<tr>
<td>Suck</td>
<td>Normal</td>
<td>Poor</td>
<td>Absent</td>
<td></td>
</tr>
<tr>
<td>Respiration</td>
<td>Normal</td>
<td>Hyperventilate</td>
<td>Brief apnoea</td>
<td>Apnoea (IPPV)</td>
</tr>
<tr>
<td>Fontanelle</td>
<td>Normal</td>
<td>Full</td>
<td>Tense</td>
<td></td>
</tr>
</tbody>
</table>

We use the Sarnat staging of Hypoxic Ischaemic Encephalopathy (developed for HIE, hence the term) only on admission – see Addendum.
Seizure Management in Neonates

Treat seizures that last > 3 minutes, recurrent seizures, or seizures that cause cardio-respiratory compromise.

Cycling/Tonic Posturing: Only treat as a seizure if persistent/compromising

First line: Phenobarbitone
20 mg/kg loading dose IV over 10 min, then 5 mg/kg/day maintenance for first 3 days
If seizures persist: Repeat loading dose 20 mg/kg IV
If IV Phenobarbitone is not available, use a 40mg/kg oral dose to load.

Second line: Midazolam
Bolus 50 micrograms /kg dilute in 5ml normal saline and give over 5 -10 min
If seizures persist, give infusion:
Take 5mg/kg and mix in 50ml of 5% dextrose
Running at 1ml/hour this is 0.1mg/kg/hr. Suggested starting dose 0.15mg/kg/hr (i.e. 1.5ml/hr) Increase by 0.05mg/kg/hr (0.5ml/hr) every ten minutes if seizures persists. Max rate is 0.5mg/kg/hr (5ml/hr of this solution)

When Seizure-free for 6 hours – wean infusion by reducing it by 0.5ml/hour hourly until down to 1.5ml/hour, then wean further by reducing it by 0.5ml/hr every six hours (i.e takes 18 hours to go from 1.5ml/hr to stopping infusion)

Third line: Lignocaine Prepared infusion
(can’t give this to preterm infants or if phenytoin has been given)
Take 100mg/5ml of IV preparation, made up to 50 ml gives 2 mg/ml.
(NB: Use half infusion doses in hypothermic infants)
Load 2 mg/kg IV over 10 min (For loading dose, draw up 1 ml/kg of prepared infusion above = 2 mg/kg) Dilute that 1 ml with 9 ml NS and infuse at 60 ml/hr over 10 mins).
Continuous infusion: use prepared infusion shown above as is. 6 mg/kg/hr (3ml/hr) x 6 hrs, then 4 mg/kg/hr (2ml/hr) x 12 hrs, Then 2 mg/kg/hr (1ml/hr) x12 hrs then stop. Total duration = 30 hrs to prevent accumulation.

Fourth line: Clonazepam/Lorazepam or high dose phenobarbitone

Note: If Lignocaine is not available use Phenytoin as a second line (20 mg/kg IV over 20 minutes) and then midazolam as a third line. If seizures still persist then consider continuous midazolam infusion, but transfer advisable as may need ventilation
Neonatal Hypoglycaemia

- This is a common AND serious neonatal problem
- Feed ALL babies within half an hour of birth (preferably with breastmilk)
- Start this protocol as soon as the baby has a glucometer (HGT) reading of 2.5 mmol/l or less.
- A glucometer reading < 2.5 mmol/l means baby is at risk of BRAIN DAMAGE

Who is at risk?
All babies who are small, sick, cold and/or not fed, and those born to mothers with diabetes.

Monitoring & prevention
- Monitor the blood glucose of sick or cold babies every 3 hours for the first 24 hours and continue until the level is normal for 24 hours
- Check the blood glucose of infants of diabetic mothers hourly, for the first 6 hrs
- If milk feeds are contraindicated, start IV fluids (neonatalyte) immediately
- Keep the baby warm

What are the clinical signs?
Often there are no symptoms or signs. There may be jitteriness or lethargy, apnoea, convulsions, or hypothermia.
Remember the vicious cycle: ↓ glucose → Can’t feed → Weak

Oral management: mild hypoglycaemia (glucose 1.8-2.5 mmol/l)
1. If HGT is 1.8-2.5 mmol/l, give 10 ml/kg breast milk (or artificial feed if indicated) IN ADDITION TO SCHEDULED FEEDS
2. Repeat the HGT 15 minutes after COMPLETION of the feed
3. If HGT more than 2.5 mmol/l, continue with normal feeds and monitor glucose level three hourly
4. If HGT again reads under 2.5 mmol/l, oral management has FAILED. Proceed to intravenous management

Intravenous management: severe hypoglycaemia (glucose < 1.8 mmol/l)
1. If HGT is less than 1.8 mmol/l, OR oral management has failed, start an IV infusion with neonatalyte (10% dextrose + electrolytes) IMMEDIATELY, at the appropriate rate for weight, gestation and age
2. When you have finished strapping and splinting the cannula give a 3ml/kg bolus
3. Repeat the HGT after 15 minutes
4. If HGT more than 2.5 mmol/l, continue with normal feeds and monitor glucose level three hourly
5. If HGT again reads less than 2.5 mmol/l, change infusion to a 15% dextrose infusion (180ml neonatalyte + 20ml 50% dextrose). At the start give a 2ml/kg bolus, then continue at required rate for age
6. Repeat the HGT 15 minutes after changing to 15% solution
7. If glucose remains low, consider transfer.
Neonatal Jaundice

Neonatal jaundice is common. The neurotoxic sequelae of a high unconjugated bilirubin are less common, but unpredictable, potentially devastating, and totally preventable. RATHER OVER-TREAT THAN UNDER-TREAT!

- A handheld meter is an ideal way to check all neonates, but might not be available.
- Have a low threshold for checking TSB in infants who look even slightly jaundiced.
- **Anticipate** NNJ – in preterm or sick babies, those with signs of bruising, those with maternal Blood group O and / or Rhesus negative blood group
- Start phototherapy while awaiting the result if baby is premature or markedly jaundiced
- Plot result on Phototherapy guideline chart and act appropriately.
- Start Phototherapy at TSB levels 30μmol/l less than line on chart for sick babies.
- Remember to patch sternum or forehead for follow up readings / clinical assessment
- If phototherapy via LED light, ensure baby kept warm – ideally in incubator. No extra fluids are necessary.
- If phototherapy via non-LED light, increase fluid requirement calculations by 10% while under lights, or increase feed frequency if breastfeeding.
- Repeat TSB every 24 hours while under lights.
- Continue Phototherapy until TSB 50μmol/l less than lighting level.
- Check TSB 24hrs after cessation of lights
- Note the pattern or **TSB tracking** of the chart (Figure 1). Note departure from “physiological” pattern e.g. early TSB rise suggesting haemolysis, or raised TSB after 10 days when phototherapy is no longer indicated (but further investigation may be indicated)
- If rate of rise of TSB is high, send a blood specimen for conjugated bilirubin, FBC / MCV, TSH, Coombs test and blood culture & urine for reducing substances and MC&S.
- Make sure mother’s RPR status has been checked.
PHOTOTHERAPY

In presence of risk factors use one line lower (the gestation below) until <1000g.
If gestational age is accurate, rather use gestational age (weeks) instead of body weight

Infants > 12 hours old with TSB level below threshold, repeat TSB level as follows:
1- 20μmol/L below line: repeat TSB in 6hrs or start phototherapy and report TSB in 12-24hrs,
21 - 50 μmol/L below line: repeat TSB in 12 – 24hrs,
>50 μmol/L below line: report TSB until it is falling and/or until jaundice is clinically resolving

Infants under phototherapy:
Check the TSB 12 – 24 h if but if TSB >30 μmol/L above the line, check TSB 4 – 6h.
STOP phototherapy:
If TSB > 50 μmol/L below the line. Recheck TSB in 12 – 24hr.

Start intensive phototherapy when the TSB is ≥ the line according to gestation or weight.
• Exchange Transfusion should be available at a referral centre.
• Early referral has better outcomes as the prognosis is poor in kernicterus.
• If you can’t refer, if the TSB persists > 150 μmol/l above the treatment line on the first graph, consider double lights. (Phenobarb and albumin are not recommended.)
nCPAP

- Neonatal continuous positive airway pressure (nCPAP) is used to support breathing in neonates with mild to moderate respiratory distress (RDS).
- It mixes medical air (that we currently have in one cylinder, still waiting for a compressor) with O2 to maintain saturations of 88-94% with a PEEP of 5-10mmH2O.
- The physiological effect of this is improving oxygenation, maintaining lung volume, lowering upper airway resistance and reducing obstructive apnoea.

Clinical indications:
- If neonate with RDS (grunting, tachypnoeic, rib retraction).
- Usual diagnostic indications:
  - Transient Tachypnoea of the Neonate (TTN)
  - Hyaline membrane disease (HMD)
  - Congenital Pneumonia
- Weight categories:
  - Under 800g usually no benefit (as single treatment modality).
  - 800-1000g might benefit if not too immature
  - >1000g ideal

Steps to start CPAP
1. Put CPAP machine “ON”
2. Open Medical Air valve to 15L/min
3. Plug O2 into wall valve
4. Set %O2 mix (Start at 60%)
5. Set Flow valve
6. Plug in Saline humidifier and let it fill
7. Put humidifier “on”.
8. Measure and fit Cap
9. Measure and fit Prongs
10. Aim for CPAP = 5-8 cm H2O (Set Pressure by ↑↓ Flow)
11. Aim for Neonate Saturation = 88-94% (↓↑ %O2)

This set up can be tricky the first time. Google “YouTube Zithulele CPAP” (click link in the electronic handbook) for a step-by-step guide to setting up our neonatal CPAP!

- Start at 60% O2,
- ↑↓ the %O2 to maintain neonate’s saturation at 88-94%.
- Aim to wean down to 21%.
- When this is reached and neonate’s breathing normal, continue for another hour
- Then remove CPAP completely.
**Bubble “Bush” CPAP Set Up**

Despite the availability of nCPAP, there are times when we need to support two infants simultaneously. A simple bubble “bush CPAP” set up can help support babies sufficiently in certain circumstances.

A decision regarding when to use this rather than transfer should be discussed with a senior doctor and will vary according to many practical considerations.

Set up is according to this diagram:

Some practical notes:
- Use a **glass** bottle if possible. (The only one available at present is the 250ml one with hypertonic saline.) Alternatively, use a plastic bottle with minimal “give”.
- Take care to properly seal the nasal prong area to prevent leakage here. Be aware of causing damage to the nasal skin and cartilage through too much pressure, however.
- Insert the needle to 5-6cm below the water and set the oxygen flow to 2l/min. Ensure that it is bubbling from the end of the needle
- If using Bush CPAP in very small babies be extremely careful not to use too much pressure as there is a risk of pneumothorax.

We also have a fancier Bubble CPAP for children, in the paed's ward. You can watch the step-wise set-up video here: [https://youtu.be/52tT0OWnS30](https://youtu.be/52tT0OWnS30)
Infants Exposed to Syphilis in Utero

Congenital syphilis is a preventable potentially fatal disease. All mothers should therefore have an RPR (WR or VDRL) checked during the early stages of pregnancy. Even if they arrive late in pregnancy or in labour, the RPR must be checked.

Infants born to mothers who are RPR Positive should be treated as below if:
1. the mother did not receive three injections of Benzathine benzylicillin a week apart
2. the mother received her third dose of Penicillin less than a month before delivery

Asymptomatic infants:
- 50 000 u/kg Benzathine benzylpenicillin IMI once off.

Symptomatic infants (with or without meningeal involvement):
- 50 000u/kg/dose Benzyl Penicillin IVI 12hrly for 10-14 days OR
- 50 000u/kg Procaine Penicillin IMI daily for 10 days

Reminder 1
Signs of congenital syphilis include:
- Small for gestational age
- Rhinorhoea (snuffles)
- Red maculo-papular rash
- Oedema
- Bullous eruptions on palms and soles (becomes desquamating)
- Hepatosplenomegaly
- Nephrotic syndrome
- Anaemia
- Thrombocytopaenia

Practically you therefore need FBC before regarding an infant as asymptomatic!

Meningo-encephalitis (convulsions)

Reminder 2
- “Benzathine penicillin” is long acting penicillin, correct name Benzathine benzylpenicillin
- Benzyl Penicillin is short acting, also called Pen G.
- Procaine penicillin is short acting & can be given IMI, has to be kept in fridge. It is intermittently available so please check before prescribing.
Paediatrics
Growth Charts

**Weight-for-age GIRLS**
Birth to 5 years (z-scores)
Weight-for-Height GIRLS

2 to 5 years (z-scores)

Weight-for-height BOYS

2 to 5 years (z-scores)
Head circumference-for-age GIRLS
Birth to 5 years (z-scores)

Head circumference-for-age BOYS
Birth to 5 years (z-scores)
## Malnutrition

<table>
<thead>
<tr>
<th>WHO classification of malnutrition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate malnutrition</td>
</tr>
<tr>
<td>Z score between -2 and -3</td>
</tr>
<tr>
<td>Weight for height</td>
</tr>
<tr>
<td><strong>Moderate Wasting</strong></td>
</tr>
<tr>
<td>(70-80% of expected)</td>
</tr>
<tr>
<td>Height for age</td>
</tr>
<tr>
<td><strong>Moderate Stunting</strong></td>
</tr>
<tr>
<td>(85-90% of expected)</td>
</tr>
<tr>
<td>Symmetrical oedema</td>
</tr>
<tr>
<td>No</td>
</tr>
</tbody>
</table>

When admitting a child with malnutrition it is best to use a “proforma” to ensure you remember everything. Please fill in the child’s name, admission weight and calculate how much starter formula they need and fill that in on the admission day’s page. (The formula for formula is also on the last page.) The prescription sheet is printed with the basic medications required on admission however please note the following:

- Use IV antibiotics (incl Genta for gram-negative cover) for all children who present with oedema, regardless of whether they have an obvious source of infection or not.
- Deworming is not necessary for children under 6 months
- Ferrous Gluconate should not be prescribed until the child is gaining weight
- In severe malnutrition with oedema and persistent diarrhoea consider giving soya milk formula. (Speak to a dietician!) See chronic diarrhoea section under HIV Opportunistic Infections for further guidance
- Do not give catch up formula to children with severe malnutrition and oedema until their oedema has resolved.
- Where appropriate strongly encourage breastfeeding even when mothers have stopped. Putting the baby to the breast regularly will soon produce milk. Mothers who are struggling to breastfeed may benefit from metoclopramide and using a breast pump.

REMEMBER TO REFER ALL MALNOURISHED CHILDREN TO THE DIETICIAN.

### MILK VOLUMES

There are two possible approaches. Either start with 120ml/kg/day of F75 (previously called “starter formula”) and do not increase the volume until the child is gaining weight well. Or, alternatively, start at **80-100ml/kg/day, increasing to 120-130ml/kg/day by Day 5**, depending on ability to tolerate feeds & whether also getting any IV fluid. Increase volume further and change to F100 (previously “catch-up”) formula once the child is gaining weight.
### DRUG DOSES FOR MALNUTRITION PROTOCOL MEDICATION

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dosage</th>
<th>Amp/vial/tab size reminder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penicillin G</td>
<td>50 000u/kg/dose twice daily</td>
<td>1 million units</td>
</tr>
<tr>
<td>Ampicillin</td>
<td>25-50mg/kg/dose 6 hourly</td>
<td>250mg or 500mg amps</td>
</tr>
<tr>
<td>Gentamycin</td>
<td>5mg/kg once daily</td>
<td>20mg per 2ml</td>
</tr>
<tr>
<td>Potassium chloride</td>
<td>3mmol/kg/day in divided doses</td>
<td>6.7mmol per 5ml of solution</td>
</tr>
<tr>
<td>ZLE Elemental Mixture</td>
<td>&lt; 10kg – 2.5ml</td>
<td>Mixed by pharmacy: Cu^{2+} 0.1mg/ml; MgSO4 280mg/ml</td>
</tr>
<tr>
<td></td>
<td>&gt;10kg – 5ml</td>
<td></td>
</tr>
<tr>
<td>Zinc picolinate</td>
<td>&lt; 10kg – 5ml</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;10kg – 10ml</td>
<td></td>
</tr>
<tr>
<td>Mebendazole</td>
<td>100mg twice daily OR 500mg STAT</td>
<td></td>
</tr>
<tr>
<td>Albendazole</td>
<td>&lt;2 years 200mg stat; &gt;2 years 400mg stat</td>
<td>400mg tabs</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>&lt;6 months – 50 000u 6-12 months – 100 000u &gt;12 months – 200 000u</td>
<td>50 000u per tablet 200 000u per capsule</td>
</tr>
<tr>
<td>Folic Acid</td>
<td>0.5mg/kg daily</td>
<td>5mg tabs</td>
</tr>
<tr>
<td>Ferrous gluconate</td>
<td>1-2mg/kg/dose 8hrly</td>
<td>Ferrous gluc 8mg/ml</td>
</tr>
</tbody>
</table>

### Social Challenges: Helping Paediatric Patients

Challenging social issues are frequently a factor when children get sick. Please involve the social worker and ask her for regular feedback. Also remember to involve the Community Health Workers by getting in contact and discussing follow up.

It may help to be aware of the following:

**Birth certificates**

Mothers should be encouraged to register births within 30 days. Registration thereafter is far more complicated! (Older children need to go to the Department of Home Affairs with a proof of birth, the mother’s ID, school certificates etc.) If possible, try to engage your local DoHA office and see if they can provide routine registrations at the hospital, if you are far from town.

**Child Support Grant**

Application for CSGs happens at SASSA, as well as intermittently at the hospital. The child needs a birth certificate and the mother’s ID. If the surnames don’t match (the most common problem), they will need a letter explaining the discrepancy and that we are satisfied it is the birth mother. Beware of fraud! We have had people bringing relatives or neighbours posing as their child.

**Support for Severe Acute Malnutrition (SAM)**

Policy dictates that children with SAM should receive assistance in the form of emergency food parcels. (And assistance with paperwork etc that may be preventing them from accessing a grant.) In practice this is still in development, but all SAM children should be notified to the social worker with a specific request to follow up with SASSA.
# Milestones of Child Development

<table>
<thead>
<tr>
<th>Age</th>
<th>Motor</th>
<th>Speech</th>
<th>Vision and hearing</th>
<th>Social</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-6 weeks</td>
<td>When held upright, holds head erect and steady</td>
<td>Cooes and babbles at parents and people they know</td>
<td>focuses on parents.</td>
<td>Loves looking at new faces. Starts to smile at parents. Startled by sudden noises.</td>
</tr>
<tr>
<td>6-8 weeks</td>
<td>When prone, lifts self by arms; rolls from side to back.</td>
<td>Vocalizes; Cooes (makes vowel-like noises) or babbles.</td>
<td>Focuses on objects as well as adults.</td>
<td>Loves looking at new faces. Smiles at parent. Starting to smile.</td>
</tr>
<tr>
<td>5 months</td>
<td>Holds head steady. Goes for objects and gets them. Objects taken to mouth.</td>
<td>Enjoys vocal play;</td>
<td></td>
<td>Noticing colours. Adjusts hand shape to shape of toy before picking up.</td>
</tr>
<tr>
<td>6 months</td>
<td>Transfers objects from one hand to the other. Pulls self up to sit and sits erect with supports. Rolls over prone to supine. Palmar grasp of cube hand to hand eye coordination.</td>
<td>Double syllable sounds such as 'mumum' and 'dada'; babbles (consonant-vowel combinations).</td>
<td>Localises sound 45cm lateral to either ear. Visual acuity adult-like (20/20). Sensitivity to pictorial depth cues (those used by artists to indicate depth) emerges.</td>
<td>May show Stranger anxiety</td>
</tr>
<tr>
<td>Age</td>
<td>Milestones</td>
<td>Milestones</td>
<td>Milestones</td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>9–10 months</td>
<td>Wiggles and crawls. Sits unsupported. Picks up objects with pincer grasp</td>
<td>Babbles tunefully</td>
<td>Looks for toys dropped</td>
<td>Apprehensive about strangers</td>
</tr>
<tr>
<td>1 year</td>
<td>Stands holding furniture. Stands alone for a second or two, then collapses with a bump</td>
<td>Babbles 2 or 3 words repeatedly</td>
<td>Drops toys, and watches where they go</td>
<td>Cooperates with dressing, waves goodbye, understands simple commands</td>
</tr>
<tr>
<td>18 months</td>
<td>Can walk alone. Picks up toy without falling over. Gets up/down stairs holding onto rail. Begins to jump with both feet. Can build a tower of 3 or 4 cubes and throw a ball</td>
<td>'Jargon'. Many intelligible words</td>
<td>be able to recognise her favourite songs, and will try to join in.</td>
<td>Demands constant mothering. Drinks from a cup with both hands. Feeds self with a spoon. Most children with autism are diagnosed at this age.</td>
</tr>
<tr>
<td>2 years</td>
<td>Able to run. Walks up and down stairs 2 feet per step. Builds tower of 6 cubes</td>
<td>Joins 2–3 words in sentences</td>
<td>Parallel play. Dry by day</td>
<td></td>
</tr>
<tr>
<td>3 years</td>
<td>Goes up stairs 1-foot per step and downstairs 2 feet per step. Copies circle, imitates hand motions and draws man on request. Builds tower of 9 cubes</td>
<td>Constantly asks questions. Speaks in sentences.</td>
<td>Cooperative play. Undresses with assistance. Imaginary companions</td>
<td></td>
</tr>
<tr>
<td>4 years</td>
<td>Goes down stairs one foot per step, skips on one foot. Imitates gate with cubes, copies a cross</td>
<td>Questioning at its height. Many infantile substitutions in speech</td>
<td>Dresses and undresses with assistance. Attends to own toilet needs</td>
<td></td>
</tr>
<tr>
<td>5 years</td>
<td>Skips on both feet and hops. Draws a man and copies a triangle. Gives age</td>
<td>Fluent speech with few infantile substitutions in speech</td>
<td>Dresses and undresses alone</td>
<td></td>
</tr>
<tr>
<td>6 years</td>
<td>Copies a diamond. Knows right from left and number of fingers</td>
<td>Fluent speech</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Diarrhoea & Vomiting in Children

1. Assess level of dehydration:
   *Hydration should usually be reassessed every 4 hours. Handovers NB!*

   Start with Severe Dehydration and move across → until you find where the child fits. Check there are no signs of Shock.

   **Signs of dehydration**
   - **Shock**
     - ≥1 sign
     - ≥2 signs
   - **Severe (10%) dehydration**
     - ≥2 signs
   - **Dehydration (5%)**
     - ≥2 signs from below
   - **No visible dehydration**
   - **Over-hydrated**

   **Level of consciousness**
   - ↓ LOC
   - Lethargic
   - Restless or irritable
   - Well, alert

   **Eyes**
   - Sunken
   - Not sunken
   - Periorbital oedema

   **Ability to drink**
   - Drinks poorly or unable
   - Thirsty, drinks eagerly
   - Not excessively thirsty

   **Skin turgor**
   - Skin pinch returns >2sec
   - Skin pinch returns <2sec
   - Skin pinch returns immediately
   - Oedema, hepar

   **Capillary refill time**
   - CRT >3sec

   **CVS**
   - ↓BP & weak pulse
   - S3 gallop

   **Urine**
   - Anuria
   - Oliguria
   - Normal
   - May be polyuric

   **Remember shock refers to intravascular volume loss while dehydration refers to extra-vascular losses. As outlined below, if the child is shocked, they need urgent resuscitation with intravenous boluses. If dehydrated, they need fluid replacement – preferably orally. Either one may occur without the other – be careful to assess properly.**

2. Admit if:
   - Drinking poorly
   - Vomiting excessively
   - Dehydrated
   - Admitted in past 1/12 for GE
   - Age < 3/12
   - Malnourished
   - Dysentery
   - Temp > 38°
   - Other infection present
   - Fits or encephalopathy
   - Hypoglycaemia
   - HIV/AIDS
   - Clinically suspected hypernatraemia
   - Deranged chemistry

3. Think about the cause:
   - Dysentery may be invasive organism (e.g. Shigella, amoeba, NEC, campylobacter) or **surgical condition** (e.g. intussusception esp if < 2/12) or a haemorrhagic gastritis following traditional enemas
Paediatrics – Diarrhoea & Vomiting in Children

- Diarrhoea may be GE or a **parenteral diarrhoea** (e.g. pneumonia, UTI, otitis media)
- Vomiting may be due to GE or **meningitis, UTI, otitis media, tonsillitis, intestinal obstruction or stenosis.**

**Lab investigations:**
Do urine dipstix and CUE, HGT and FBC in any of the following:
- severe illness,
- any red flag admit (readmit, < 3/12, malnutrition, fever, dysentery, fits or ↓LOC)
- failure to improve despite adequate therapy,
- hypotonia / ileus,
- respiratory distress,
- excessive vomiting in the face of min diarrhoea
- Anuric despite adequate fluid management
- Doughy skin/questionable home prep of ORF

<table>
<thead>
<tr>
<th>Other common tests...</th>
<th>and their indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>CXR</td>
<td>Suspected pneumonia (incl aspiration), TB</td>
</tr>
<tr>
<td>AXR</td>
<td>Suspected intestinal obstruction; perforation, NEC</td>
</tr>
<tr>
<td>Blood culture</td>
<td>&lt; 3 months old, suspected infection, severe malnutrition with oedema</td>
</tr>
<tr>
<td>LP</td>
<td>&lt; 3 months old, meningitis, convulsion</td>
</tr>
<tr>
<td>Urine M,C&amp;S</td>
<td>&lt; 3 months old, septicaemia, UTI, kwashiorkor</td>
</tr>
<tr>
<td>Stool M,C&amp;S</td>
<td>Dysentery (blood in stool), pyrexia, diarrhoea &gt; 14 days</td>
</tr>
<tr>
<td>HIV serology</td>
<td>All children, especially… Lymphadenopathy, failure to thrive/wasting</td>
</tr>
</tbody>
</table>

4. **Fluid treatment:**

**Shock:**

Needs **INTRAVENOUS** fluids

If struggling for access, use an **INTRA-Osseous** line or put in a NGT

**IO tip:** **Use a spinal needle inside a green 18G. Secure to skin with umbilical clamp**

Bolus of 20ml/kg of MRL or normal saline. **NO ½ DD!**

Repeat bolus if still shocked

Thereafter use 5-10ml boluses until there are signs of N intravascular volume

**Dehydration**

It is preferable to rehydrate **ORALLY** if possible (see comment for those 10% dry below). **This may require a NGT to begin with.** A good way to explain to mom is 5ml every 5 min or 10ml every ten minutes (with appropriate syringe, depending on kid size)

Give rehydration fluid intravenously if the child has
- decreased LOC,
- pneumonia, or is an aspiration risk for another reason,
- persistent vomiting
- bowel obstruction, OR
- fails to improve with oral rehydration.
For 5% dehydration, give 50ml/kg/24 hours
For 10% dehydration, give 100ml/kg/24 hours (do not give more than this)
Make doubly sure that the patient is not shocked.
Err on the side of giving the fluid IV rather than orally once 10% dry.
Give this IN ADDITION TO maintenance requirements
Rehydrate SLOWLY and carefully in the presence of malnutrition

Ongoing losses
A good starting guess is to give 50ml/kg/24 hours (or 30-50 ml per stool if on orals)
Give this IN ADDITION TO maintenance requirements

Maintenance

<table>
<thead>
<tr>
<th>Age</th>
<th>Fluid Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1 year</td>
<td>120 ml/kg/24 hrs</td>
</tr>
<tr>
<td>1-2 years</td>
<td>100 ml/kg/24 hrs</td>
</tr>
<tr>
<td>2-3 years</td>
<td>85 ml/kg/24 hrs</td>
</tr>
<tr>
<td>&gt; 3 years</td>
<td>70 ml/kg/24 hrs</td>
</tr>
</tbody>
</table>

Can use 4:2:1 rule. (4ml/kg/hr for 1st 10kgs, 2ml/kg/hr for next 10kgs and 1ml/kg/hr for any kgs above 20kg)

Fluid selection:
IV Resuscitation: Ringers or normal saline
IV Rehydration, Losses or Maintenance: ½ DD
NGT rehydration: ½ DD or milk
Oral Rehydration: Oral rehydration solution (home mix or Orsol)
Oral Maintenance: Breast / Formula

Helpful fact:
With a 60-dropper, the “number of drops per minute = millilitres per hour”

5. Drug management
Zinc
All children with diarrhoea should get Zinc picolinate for 14d or longer if the gastro persists.
Under 10kg: give 5ml daily (10mg zinc)
Over 10kg: give 10ml daily (20mg zinc)

Potassium
All children in hospital with diarrhoea must receive oral KCl. Dose is 3mmol/kg/day in divided doses. (Our solution is 6.7mmol per 5ml of solution.) Ensure urine being passed before KCl prescribed.

Loperamide. Do NOT use in children. It may mask the severity of disease.

6. On discharge
Advise mom to feed 5 meals a day for at least a month following the diarrhoeal disease and give other hints to increase calorie intake.

Additional advice
Add a spoon of oil to each meal.
Frequent small meals
Ensure all fluids are calorie containing
Make meals a social occasion
Plan bigger meals in AM
Vitamin BCo is an appetite stimulant

For management of chronic diarrhoea see opportunistic infections in HIV
**Paraffin Ingestion**

Reminders about paraffin ingestion:
1. 20-40% of children who ingest paraffin will develop chemical pneumonitis.
2. Chemical pneumonitis develops between 30 minutes to 6 hours after ingestion.
3. The pneumonitis is worst between 24 and 48 hours.
4. Pneumonitis is not prevented by antibiotics.
5. Ingestion of large amounts of paraffin may cause CNS signs:
   - a. Confusion
   - b. Loss of consciousness
   - c. Convulsions

Management of pneumonitis
1. Oxygen if needed (check saturations using pulse oximeter)
2. Observe in hospital
3. DO NOT induce vomiting
4. Give antibiotics only where secondary infection

**Discharge**
1. Discharge 24 hours after time of ingestion provided NO coughing, tachypnoea or dyspnoea.
2. If pneumonitis develops, wait until symptoms completely resolved – may take up to a week.
3. Educate care giver regarding safe storage of paraffin and other household poisons.

**Reminders Re Normal**

**Normal heart rate in children:**
Newborn: 120-140; 1 year: 80-140; > 2 years: 70-115

**Normal respiratory rate in children** (breaths per minute)
Newborn 40-50
1 year 30-40
2-5 years 20-30
>5 years 15-20

**Body Surface Area Calculation**

\[ m^2 = \sqrt{\text{height in cm} \times \text{weight in kg}} / 60 \]
Post-Streptococcal Glomerulonephritis

NB: PSGN usually occurs in adequately nourished children, of pre-school or school going age. If younger than 3 years, exclude other diagnoses

1. Admission criteria
   - Hypertension (see guide to 95\textsuperscript{th} tile for age)
   - Oliguria
   - Severe oedema

\textbf{Guide to 95\textsuperscript{th} percentile values for blood pressure by age:}

<table>
<thead>
<tr>
<th>Age</th>
<th>Systolic</th>
<th>Diastolic</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 wks to 6 yrs</td>
<td>115/80</td>
<td>9 years</td>
</tr>
<tr>
<td>8 years</td>
<td>120/82</td>
<td>10 years</td>
</tr>
<tr>
<td>12 years</td>
<td>135/88</td>
<td>14 years</td>
</tr>
</tbody>
</table>

2. Investigations (on admission)
   - Urine dipstick
   - Blood for
     - CU&E (take note of K+)
     - ASOT (anti-DNAse more helpful in PSGN post skin infection)
     - Complement C3 (do when diagnosis uncertain; low in PSGN)
   - CXR if you suspect fluid overload (look for cardiomegaly, congestion & effusions)

3. Monitoring
   - Daily
     - Input and Output
     - Weight (may be better than intake output in small children)
     - Urine dipstick
   - Six hourly blood pressure (and treat appropriately)

4. Fluids
   - Fluids should be given orally where possible
   - Calculate fluids daily based on clinical status & urine output
     - Pulmonary oedema and oliguria/anuria – no fluids
     - Hydrated anuric patient, no pulm oedema – give oral fluids to replace insensible losses (25ml/kg/day)
     - Hydrated patient with or without oliguria – give oral fluids for insensible losses (25ml/kg/d) plus previous day’s output
   - When calculating daily fluid prescription remember water in foods e.g. milk with breakfast

5. Drug treatment (ensure doses are doable!)
   - Everyone: Oral penicillin (Pen VK) 250mg 8hrly for 10 days
   - Hypertension >95th:
     - Furosemide 1mg/kg/dose IVI. Give 1-3x per day
     - Add Propranolol 1-2mg/kg/day divided 6hourly (or as possible depending on weight. Tab size: 10mg) Max dose is 4mg/kg/day
     - Alt Nifedipine 2mg/kg/day or if > 6 yrs Amlodipine 2.5-5mg dly
     - If CCBs unavailable, use Captopril 0.3-0.5mg/kg/dose up to max 6mg/kg/day divided 6-12-hourly (Tab size: 25mg)
   - Hypertensive crisis:
     - Furosemide 1-2mg/kg/dose. If oliguric increase to 5mg/kg/dose
     - Add Labetalol 0.2-1mg/kg/dose bolus, infusion 0.25-3mg/kg/hour against BP
   - Diazepam 0.1mg/kg/dose IVI if seizures
6. **Dietary treatment**
   - High calorie, LOW SALT diet, RESTRICT WATER
   - No protein while blood urea is elevated

7. **Emergency referral if:**
   - Deteriorating clinical condition
   - Blood urea > 50mmol/l
   - Potassium > 7mmol/l
   - Severe acidosis
   - Severe circulatory congestion

8. **Discharge**
   - once admission criteria have resolved
   - normotensive on single agent only

9. **Follow up plan**
   - Follow up for at least six months or until urine is clear (document this)
   - If proteinuria persists at six months, needs referral for biopsy (worth excluding schistosomiasis first). Will need a urine PCR.
Chronic Childhood Asthma

Although some aspects of this protocol are still difficult to implement in a rural setting, it is here as a reminder of the importance of treating chronic asthma properly.

DIAGNOSIS
- Diagnose asthma if there is a recurrent expiratory wheeze or cough responsive to a bronchodilator.
- Other features supporting the diagnosis are
  - the cough is worse at night or on exercise
  - a personal or family history of atopy
  - seasonal variation in symptoms

Differential Diagnosis
Recurrent or persistent wheeze and NO clear response to bronchodilators, consider:
- gastro-oesophageal reflux (infants)
- tuberculosis (toddlers)
- foreign body (usually a unilateral wheeze)

INVESTIGATION
Keep to a minimum
1. **Chest X-ray**
   - if no hyperinflation, reconsider diagnosis
   - exclude other conditions e.g. TB
   - look for narrowing of bronchi e.g. by lymph nodes
2. **Peak expiratory flow rate** (in children older than 5yrs).
   A 10% improvement 10 minutes after an inhaled bronchodilator strongly suggests asthma.

ASSESSMENT OF SEVERITY (regular or intermittent symptoms)

<table>
<thead>
<tr>
<th></th>
<th>Severe</th>
<th>Moderate</th>
<th>Mild</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency of attacks</td>
<td>More than 1/wk or continuous</td>
<td>1/wk</td>
<td>Not more than 1/mth</td>
</tr>
<tr>
<td>Night time cough/wheeze</td>
<td>Frequent</td>
<td>Infrequent (&lt;1/wk)</td>
<td>No</td>
</tr>
<tr>
<td>Previous admissions</td>
<td>ICU admission or &gt;1 other admission</td>
<td>1 previous admission</td>
<td>No</td>
</tr>
<tr>
<td>PEFR* (%predict)</td>
<td>&lt;60</td>
<td>60-80</td>
<td>&gt;80</td>
</tr>
</tbody>
</table>

- When in doubt, assign a patient to most severe grade in which any feature occurs.
- **Regular re-assessment at least every 3 months.**
- A diary of symptoms is useful.
- **Peak expiratory flow rate.** Read off the predicted rate from the table below, using the patient’s height. This measurement is more sensitive and objective than clinical assessment (in children > 5 yrs). Do not use PEFR during acute attacks to classify patients for chronic management.
Predicted values:

<table>
<thead>
<tr>
<th>Height (cm)</th>
<th>PEFR (l/min)</th>
<th>80%</th>
<th>Height (cm)</th>
<th>PEFR (l/min)</th>
<th>80%</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>110</td>
<td>88%</td>
<td>140</td>
<td>316</td>
<td>253%</td>
</tr>
<tr>
<td>105</td>
<td>135</td>
<td>108%</td>
<td>145</td>
<td>342</td>
<td>274%</td>
</tr>
<tr>
<td>110</td>
<td>161</td>
<td>129%</td>
<td>150</td>
<td>368</td>
<td>294%</td>
</tr>
<tr>
<td>115</td>
<td>187</td>
<td>150%</td>
<td>155</td>
<td>394</td>
<td>315%</td>
</tr>
<tr>
<td>120</td>
<td>213</td>
<td>170%</td>
<td>160</td>
<td>420</td>
<td>336%</td>
</tr>
<tr>
<td>125</td>
<td>239</td>
<td>191%</td>
<td>165</td>
<td>445</td>
<td>356%</td>
</tr>
<tr>
<td>130</td>
<td>265</td>
<td>212%</td>
<td>170</td>
<td>471</td>
<td>378%</td>
</tr>
<tr>
<td>135</td>
<td>290</td>
<td>232%</td>
<td>175</td>
<td>497</td>
<td>398%</td>
</tr>
</tbody>
</table>

MANAGEMENT

Goal: A normal life, i.e. regular school attendance, participation in sport, restful sleep, normal growth, avoidance of hospital admissions and minimal attacks.

Indications of inadequate control:
- disturbed sleep (as a result of a wheeze or cough)
- frequent absence from school
- not participating in sport and exercise

Avoid important ENVIRONMENTAL TRIGGERS:
- cigarette smoke should not be allowed in the home
- house dust control measures, when practical:
  - plastic mattress and pillow covers - if pillow cover not available, wash pillow in hot water
  - dust with damp cloth
  - remove loose bedroom carpets
  - preservatives eg sulphur dioxide in fruit drinks

DRUG PLAN

Mild: Intermittent bronchodilator
Salbutamol 200ug (2 puffs) when necessary 4-5 x daily
Administration:
  < 7yr: Metered dose inhaler with spacer (see Notes below)
  > 7 yr: Metered dose inhaler
If no spacer available and under 7 years, salbutamol 0,15mg/kg/dose orally when necessary 6 hourly.

Moderate: Beclomethasone (Beclate) metered dose inhaler, with spacer
NB: preferably quote the dose in μg(mcg), not puffs. (The formulation contains 50μg(mcg) per puff.)
Start with 50-100μg(mcg) once daily and then tailor the dose according to response. Use the lowest effective dose. Very high doses >200μg(mcg) may retard growth.
PLUS
Intermittent bronchodilator (as for mild asthma)
Severe: Beclomethasone (Beclate) MDI, with spacer (as above)  
PLUS  
Intermittent bronchodilator (as above)  
PLUS  
Montelukast (leukotriene receptor antagonist) 4-5mg nocte

EXACERBATIONS OF SYMPTOMS
Prednisone 2mg/kg/day (max dose 40mg) in early morning for 3 days, in the following circumstances:
- exacerbation lasting longer than 1 day  
- patient on inhaled steroids  
- a short course of steroids in the last 3 months  
- poor response to bronchodilators  
- severe obstruction on arrival
If prednisone is prescribed, give an appointment to review baseline control in 1 week.

EXERCISE INDUCED ASTHMA
Use an inhaled beta-2 agonist just before exercise.

UNNECESSARY THERAPY
- antibiotics (unless bacterial super-infection is strongly suspected)  
- cough syrups  
- mucolytics  
- breathing exercises
Use physiotherapy only where there is lobar collapse.

DANGEROUS THERAPY
- rectal aminophylline  
- immunotherapy (desensitisation)  
- tranquillisers

REFER for diagnostic assessment if:
Recurrent wheeze not responding to a bronchodilator.
Burns

Burns are a very common, and the correct management is easy if you do the basics right. Our approach is based on the SA Burns Unit. Please do visit them (www.saburnunit.co.za) for more resources and consider contacting them on their 24hr hotline (071-425 6000) if there are any difficult cases. This is especially useful in major (>50%) burns when the decision to palliate can be made with expert consultation.

In the unresponsive or shocked burn patient, the standard ABC’s apply, but for the most part our patients will be walking in to OPD, and they are often under triaged.

Please try to identify them early and start the protocol as soon as possible after arrival.

1. **Acute pain management**
   - Clingfilm temporary cover
   - Analgesia (oral) – 20-30 minutes until peak effect, no sats monitoring needed
     - Paracetamol 10-20 mg/kg
     - Ketamine 5mg/kg
     - Midazolam 0.1-0.25mg/kg

2. **First Aid**
   - In the first 6 hours after a burn, ALL burns should get a MINIMUM 20 minutes of cool running water
   - Practically, send the patient to shower for 20 minutes in the ward, this also allows time for the oral meds to work

3. **Wound bed preparation**
   - A proper initial scrub is essential. Remove blisters. Clean thoroughly.
   - 5% Chlorhexedine (Bioscrub) wash of the entire area
   - Sodium-Hypochlorite 0.006% (dilute 6ml Milton or 1.7ml Jik in 1L sterile water), Cover wounds with soaked abdominal swabs for 10 minutes

4. **Estimate TBSA**
   - This must only be done after wound bed preparation, as correct assessment of TBSA is key to the correct fluid management
   - Please take photos (with permission) to help the ward doctor gauge progress, and indicate in the notes the depth of each burn
   - Consider emergency referral (discuss first with senior on call) if
     - >15% TBSA burns or >5% TBSA full thickness burn
     - Inhalation injury
     - High Voltage Electrical injury
     - Neonate
   - Generally, we admit most paediatric burns for sedation and dressings
5. Fluid management

- Only commit to fluid volume once you have seen a well prepared wound bed for proper estimation of TBSA
- >15% TBSA needs aggressive fluid resus, and output monitoring
- Total volume of resus fluid required is 2ml/kg/%TBSA/24hrs crystalloid
  a. Half of that volume must be given within 8 hours of the burn (within reason),
  b. The second half must be given in the remainder of the 24hrs post burn.
  c. Please prepare the bags and label them for the nurses to ensure the correct volume is given
  d. The main aim is to ensure urine output of 0.5-1ml/kg/hr. If less is passed, give IV boluses. If more is passed, consider reducing fluid rate
- REMEMBER to still give maintenance fluid with ½ DD in addition to the resus fluid
- 10-15% TBSA does not need fluid resuscitation. But full maintenance fluid must be given IVI in children under 5 years of age using ½ DD.
- <10% TBSA does not require any additional fluids

<table>
<thead>
<tr>
<th>Depth</th>
<th>Appearance</th>
<th>Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superficial</td>
<td>Dry, minor blisters, erythema, brisk capillary refill</td>
<td>Painful</td>
</tr>
<tr>
<td>Partial thickness – superficial</td>
<td>Moist, reddened, with broken blisters, brisk capillary refill</td>
<td>Painful</td>
</tr>
<tr>
<td>Partial thickness – deep</td>
<td>Moist white slough, red mottled, sluggish capillary refill</td>
<td>Painless</td>
</tr>
<tr>
<td>Full thickness</td>
<td>Dry, charred, whiteish, absent capillary refill</td>
<td>Painless</td>
</tr>
</tbody>
</table>
6. Dressing
- In the ideal world, all deep partial thickness and full thickness wounds must be debrided and grafted early. This may not be an option.
- Please consult the table on “Which Dressing When” in the Pharmacy section to guide an appropriate, cost-effective choice.
- In superficial or superficial partial thickness wounds, use Paraffin gauze, Betadine or Aquacel dressings depending on when you anticipate needing to review the wound. (DON’T use Aquacel on full thickness)
- Please note the following about Aquacel dressings:
  o They are amazing – and expensive. Don’t use them if you anticipate wound review in less than 7 days.
  o You can leave the dressing on for up to 14 days and let it peel off.
  o If exudate soaks through the dressing, apply gauze or drawtex on top of the Aquacel.
- Aquacel Ag has broad spectrum antimicrobial effect, and is especially useful against pseudomonas. The Hypochloride soak is also effective against pseudomonas so Aquacel Ag is not to be routinely applied. Consider it for heavily contaminated wounds or if outpatient care will be given without systemic antibiotic cover

7. Ward management
- Include the entire MDT, esp Physio, OT and Dietician from day one
- Adequate supplementation and nutrition speeds up healing
  1. MVT 7.5 ml OD (≤ 10kg) 10ml OD (>10kg)
  2. **Ferrous gluconate** 1ml/kg/d in div doses
  3. **Vit E** 100iu OD
  4. **Vit C** 100mg OD (≤ 10kg), 200mg OD (>10kg)
  5. **Folic acid** 0.5mg/kg OD (tab=5mg)
  6. **Vit A** 100 000IU stat (6 – 12mo) 200 000IU stat (>1y old > 10kg)
  7. **Deworm**
  8. **Zinc picolinate**
     Under 10kg: 5ml (10mg) OD
     Over 10kg: 10ml (20mg) OD
  9. **Gastric ulcer prophylaxis**
     if >10% burn
     Lansoprazole 30mg OD if >30kg. Discuss with pharmacy if <30kg
  10. **Sunscreen and coconut oil** on discharge if possible
- Adequate pain management!
- Use oral cocktail as above, increase Ketamine by 30% a week
- If breakthrough pain – STOP THE PROCEDURE and give rescue dose analgesia (Ketamine 2-3mg/KG PO or Morphine 0.1-0.2mg/kg PO), if this is still inadequate, consider IV sedation with full monitoring
- **Watch for sepsis.**
  o Normal vitals in burns: HR up to 130, Temp <38.4, normal RR, BP
  o Signs of sepsis: Values outside above; hypothermia, low WCC, hypoglycaemia, diarrhoea
  o Don’t treat pus swab results with antibiotics, treat sepsis
First Time Convulsions in Children

This protocol isn’t intended as a comprehensive treatise on managing epilepsy in children, but rather offers some important reminders when faced with a child with a history of first-time seizures.

Remember:
- The incidence of TB and bacterial meningitis in our community is high. If you are at all unsure, rather do a full work up including LP.
- Neurocysticercosis is common in adults but less common in children who have had less exposure to ingested tapeworm eggs. It should not be diagnosed or presumed under 2 years of age.
- Some other causes encountered relatively often and worth thinking about are: toxins (granny’s meds?), alcohol (esp on PHs) and mushrooms.

Febrile seizures
Although these are common, do NOT diagnose them unless the seizure meets ALL the criteria:
- Associated with a fever > 38 °C
- Generalised – never focal
- Seizure lasts less than 30min
- Normal neurology before and after the episode
- Preferably a known extra-cranial source of infection
- Age range: 6 months to 5 years

When should you start anti-convulsants?
- Recurrent seizures
- Prolonged seizure (even on first presentation)

Choice of anti-convulsant
1. Phenobarbitone - If under 1 yr or cognitive impairment due to cerebral palsy
2. Sodium valproate - First choice in everyone else
3. Lamotrigine can be used as a second line, but can be tricky to manage. Please discuss with an experienced doctor if unsure.

Focal seizures in children
- Focal seizures over five years can be treated as for adults. In our context the most likely cause is neurocysticercosis.
- Children under five years need referral for a CT scan. (Ensure the seizures are confirmed as focal – take a careful history!)
Using the endocervical brush

**Obtain**
An adequate sample from the cervix using a cervix brush (green broom-like device). Insert the central bristles of the brush into the endocervical canal deep enough to allow the shorter bristles to fully contact the ectocervix.
Push gently, and rotate the brush 360° in a clockwise direction 5 times.

**Rinse**
The cervix brush immediately into the PreservCyt® Solution vial by pushing it into the bottom of the vial 10 times, forcing the bristles apart. As a final step, swirl the brush vigorously to further release material. Visually inspect the cervix brush to ensure that no material remains attached. Discard the collection device.
Do not leave the head of the cervix brush in the vial.

**Tighten**
The cap so that the black torque line on the cap passes the black torque line on the vial.
Do not over-tighten.
Interpreting the PAP smear result and making a plan
Infertility: A Very Basic Approach

Definition
Inability to conceive after one year of regular sexual intercourse without contraception.

Counselling
Lifestyle modification: weight optimisation, stop smoking, regular sexual intercourse

Investigations
- Prolactin level
- Mid-luteal (day 21) progesterone assay: >30nmol/l suggests adequate ovulation
- Partner semen analysis
- Referral for further work-up including possible hysterosalpingogram

Amenorrhoea: A Basic Approach

Definition
Primary: No menstruation by 16 years old in the presence of secondary sexual characteristics
Secondary: Amenorrhoea for at least three months in women with previous normal menses

Investigations
- BMI
- Urine pregnancy test
- Pelvic ultrasound
- Serum TSH, FSH, LH, Prolactin
  - FSH >15 units/l in a woman < 40 years of age suggests premature ovarian failure
  - LH/FSH ratio of > 2:1 suggests polycystic ovarian syndrome

Treatment
- Treat hyperprolactinaemia, hypo- or hyperthyroidism
- If no cause for secondary amenorrhoea found:
  - Medroxyprogesterone acetate (“provera”) 10mg daily for 10 days
    - Anticipate a withdrawal bleed 5-7 days after conclusion of treatment

Referral
- All primary amenorrhoea
- Secondary amenorrhoea not responding to progestin challenge test
- Premature ovarian failure or polycystic ovarian syndrome
Abnormal Uterine Bleeding: A Basic Approach

Definition
Abnormal uterine bleeding with no organic cause

General
- All women over 45 years need ultrasound and endometrial sampling
- Exclude organic causes, e.g. fibroids

Treatment
Stop acute bleeding
- Progestin 5mg 4 hourly until bleeding stops, or a maximum of 48 hours OR
- Tranexamic acid 1g PO 6 hourly on days 1-4 of cycle

Restoring cyclicity
- Combined oral contraceptive 1 tab PO daily for 6 months
- Other options, incl progestin, tranexamic acid, ibuprofen, but need to be taken on specific days of the cycle

Pain relief
- Use Brufen 400mg 8 hourly to relieve dysmenorrhoea

Menopause: A Basic Approach

- In our setting we have very few women presenting primarily complaining of symptoms related to menopause. It should nonetheless be on the radar. Very simply, hormone replacement therapy started soon after menopause and continued for 5-10 years has generally positive benefits. When HRT is started late the risks may outweigh the benefits
- Menopause before age 40 should be investigated.
- Specific treatment options as well as contraindicated should be reviewed.

Recurrent miscarriage: First steps

- In women with two miscarriages in the first or second trimester should be worked up.
- Investigations that can be done at district hospital level include:
  - Uterine assessment – bicornuate uterus, fibroids
  - Anticardiolipin antibodies (IgG and IgM) as well as Lupus antibodies. These tests should be done twice, 6-8 weeks apart.
  - TSH
- Referral for further investigation and management is then appropriate.
**Miscarriage: Out-Patient Management**

**Terminology**
The word abortion is harsh and creates ambiguity of intention. Rather use “miscarriage” for unintentional loss of pregnancy and “termination of pregnancy” for intentional.

Miscarriage is the ending of a pregnancy before 26 completed weeks of gestation.

**Assessment**
Important aspects of assessment include:
- History of LMP, previous palpation or ultrasound findings.
- Positive pregnancy test
- Amount of bleeding, whether clots were passed
- If POC passed, were they complete (in later pregnancy)
- Vaginal examination: assess uterine size, contraction, amount of bleeding, dilatation of the cervix, and presence of POC in cervical os or vagina

**Acute management**
- Get wide bore IV access if the patient is bleeding heavily, is anaemic or shocked
- Always exclude an ectopic pregnancy if this has not already been done – a positive pregnancy test with an acute abdomen is an ectopic until proven otherwise. Ultrasound scan is VERY unreliable in the diagnosis of ectopic pregnancy, except in the hands of expert and experienced personnel. Consider colpo-puncture as a diagnostic option if you suspect a ruptured ectopic.

**Threatened miscarriage**
- This is bleeding from the cervix, without dilatation of the cervix.
- Determine whether the fetal heart is still beating and the baby is still alive
- If the baby is alive, treat purely symptomatically – hormones, tocolytics and bedrest have all been shown by meta-analysis to have no effect on the prognosis of the pregnancy
- If she can rest at home, DO NOT ADMIT the patient unless she is bleeding heavily – i.e., more than she does with a menstrual period. If rest is unrealistic in her situation, rather admit her.
- If the baby is dead, she needs admission to the maternity ward and termination of the pregnancy.

**Inevitable miscarriage**
- This is when the cervix has started dilating.
- Admit her to the maternity ward, and start her on IV Syntocinon 20 units per litre of Ringers and Misoprostol (“Cytotec”) 2 tablets 6 hourly per os with water.
- If you are not sure if it is inevitable, manage expectantly unless bleeding heavily, or ask for a second opinion.
**Incomplete miscarriage**

- Here the fetus has been passed and all or part of the placenta is still in the uterine cavity.
- Try and remove the products digitally or with a sponge forceps in OPD.
- If she is not bleeding much, and you are unsure if there might still be some POC in the uterus, you can manage her with Misoprostol (Cytotec), 2 tabs stat per os and 1 tab 6 hourly per os – total 6 tabs.
- This can be done as an out-patient if she lives close to the hospital. Make sure she can return of problems, or for follow up after one week.
- At one week if there is still evidence of RPOC she will need evacuation of the uterus. *Note: Diagnosing RPOC by ultrasound is inaccurate. Limits for endometrial thickness from 8-25mm have been proposed, but none proven. Generally, an endometrium ≤10mm probably won’t need evac while one >25mm almost certainly will.*

**Complete miscarriage**

- This is when you have confirmed passage of the fetus and placenta by seeing the products
- Or you have made a clinical diagnosis on the grounds of the cervix closing again, the uterus being well contracted, and there not being much bleeding
- If the woman is stable, discharge her on Cytotec 2 tabs stat, and 1 tab 6 hourly, giving her a total of 6 tablets

For second trimester miscarriage and first trimester miscarriages that require more than medical treatment, do manual vacuum aspiration (MVA) or curettage in theatre, under sedation (an opioid combined with a short acting benzodiazepine works well).

**Septic miscarriage** requires six hours of IV antibiotics (Augmentin 1.2g) before theatre, unless haemodynamically unstable (requires earlier intervention). Consider referral pre- or post-evac.

**Conservative Management of Ectopic Pregnancy**

Depending on the setting, up to one third of women presenting with ectopic pregnancy may be candidates for medical therapy rather than surgery.

If you are struggling to differentiate between a miscarriage and an early, unruptured ectopic, consider doing serial βHCG, which must be 48 hours apart.

Surgery is required for:
- Haemodynamically unstable patients
- Signs of impending or ongoing rupture
- Desire for sterilisation
- Heterotopic pregnancy
- Methotrexate therapy contraindicated (breastfeeding, significant renal or hepatic abnormality, active pulmonary disease or peptic ulcer disease) or if MTX treatment fails
If haemodynamically stable and no signs of rupture, the ectopic should be visualised prior to surgery.

Criteria for methotrexate therapy are:
- Haemodynamically stable
- βHCG <5000 milli-iu/ml if known
- No fetal cardiac activity on ultrasound
- Able to follow up

**Treatment plan**
- Use a single dose of Methotrexate 50mg/m² of Body Surface Area or 1mg/kg given PO (MTX comes in 2.5mg tabs.)
- Repeat βHCG on day 4 and day 7. If βHCG decrease from day 4 to day 7 is <15% then give a second dose. (Note: an increase in βHCG from day 1 to day 4 is not cause for concern.)
- Continue to monitor βHCG until it returns to zero.

**Hyperemesis Gravidarum: A Basic Approach**

**Definition**
Recurrent vomiting in pregnancy, leading to ketosis, usually in first trimester

**Investigate**
- “Do bloods” to exclude Medical causes, e.g. thyrotoxicosis
- “Do a scan” to exclude Molar pregnancy

**General**
- Counselling
- Frequent small meals, avoid fatty or spicy foods
- Ensure adequate hydration

**Treatment**
- Pyridoxine 25mg 8hourly PO
- Metoclopramide 10mg 6hourly PO or IV as needed
- VitBCo IV 10ml
- If refractory, add Dexamethason 4-8mg daily IM or IV
- Consider Ondansetron 4-8mg IV daily

**Molar Pregnancy (Gestational Trophoblastic Neoplasia)**

Molar pregnancies are usually benign, with a 2-4% risk of developing choriocarcinoma and 15% risk of becoming an invasive mole. They usually present with painless vaginal bleeding, a positive pregnancy test and 16-20 weeks pregnant. Presenting symptom can also be hyperemesis gravidarum due to the rapid rise in β-HCG, so do a U/S to exclude a molar pregnancy when severe vomiting is the presenting complaint. Due to the risk of severe bleeding when
molar pregnancies are evacuated, this should be done at NMAH (where emergency blood is more available). At Zithulele we need to do the complete workup and aftercare for these patients as follows:

1. Do bloods (quantitative β-HCG, FBC, ALT, GGT, U&E)
2. CXR (to exclude lung mets)
3. Discuss contraception for the next year (cannot fall pregnant for the following year since monitoring for choriocarcinoma changes is by tracking β-HCG). Consider doing a BTL WITH the evacuation if patient is so inclined.
4. Refer patient to NMAH for evacuation. Request follow-up at Zithulele Hospital to get histology results.
5. Do monthly quantitative-β-HCGs. This must be <5 by 3 months and stay <5 for the duration of the following 12 months. Immediate referral to NMAH if β-HCG-levels climb at any stage or does not fall below 5 within 3 months.

**Blood Tests on Admission to Maternity**

All women admitted to Maternity Ward, whether ante-natal, in labour or post-partum should have the following blood tests checked & results noted:

1. HIV status
   a. If negative, has it been repeated within the past 4 weeks?
   b. If positive:
      i. Was a CD4 count done?
   c. If on HAART before pregnancy or longer than 3 months, has VL been checked?
2. RPR
3. Hb
4. Rhesus

The following results should be brought to the doctor’s attention for action:

1. Positive RPR result that has not received three injections
2. Hb < 6 g/dl
3. Rhesus negative
Ultrasound – A Very Basic Guide to Obstetric US

General overview
Always first step
Don’t Measure straight away… you WILL miss something
1. Hold probe longitudinally above symphysis pubis, then slide probe upwards to fundus
2. With probe still longitudinal move across abdomen at umbilicus to ID no. of fetal spines.
3. Build up a 3D picture for yourself of fetal orientation, etc. Check
   No. of foetuses
   Presentation and lie
   Fetal heart action
   Placental position
   Liquor volume
   Maturity/estimated weight

Specific views
Now scan from suprapubic region upwards to measure fetal Head, abdomen and femur length.

Biparietal diameter
First view head and spine longitudinally, then rotate probe 90°
3 parameters to measure within
1. Head being oval shaped. If not try angulating probe a bit
2. The dark thalami being on each side more posteriorly.
3. The falx cerebri being in the midline
Now measure from outside of skull on one side to opposite.

Abdominal circumference
First obtain view of spine or aorta longitudinally, then rotate probe 90°.
3 criteria for measuring
1. Abdomen being circular, and aorta circular
2. Stomach bubble being visible. (in between heart and kidneys)
3. Umbilical vein visible in anterior third. It should be short. If long axis too oblique.

Femur length
Scan longitudinally down fetus until you see bladder. Just below you may see dense white spot. Rotate slowly about 70° anticlockwise to view length of femur. It is distinguished from patella by being single bone.
You need to see soft tissue at each end to be sure you are seeing entire shaft.
When measuring, only include the shaft. Not femur head or patella.

Placenta
It is whiter than rest, covered by continuous white line.
Keep this continuous white line in view as you trace placenta downwards.
Placenta praevia is defined as extending within 5cm of internal os and below the presenting part,
1. Basic rule… a placenta that starts at fundus unlikely to be praevia
2. Hold probe transversely over head. If placenta still visible and head not. It is praevia
In the 2nd trimester praevia should not be diagnosed unless entire os is covered.

Reminder: After 24wk only BPD and FL are helpful to assess growth. Mention AFI and placental grade too.
Hypertension in Pregnancy

Notes:
1. Hypertensive disorders of pregnancy remain a leading cause of perinatal and maternal morbidity and mortality in South Africa.
2. The approach to managing hypertension in pregnancy varies a bit around the world. The NICE guidelines from the UK use a treatment cut off of 150/100. In the US the ACOG recommends only treating blood pressures persistently above 160/110. In South Africa, the National guidelines emphasise a target of 140/90. Balancing attempts to achieve this with the risks associated with over-treatment can be tricky.
3. While managing the hypertension is not proven to alter the course of the disease it does have a role in preventing haemorrhagic strokes, CCF and even death in the mother.
4. It is imperative to remain on the same page as a team in the way that you treat this important disease. How much you can do without referring depends on your context, staffing and experience levels.

AIMS IN MANAGING HYPERTENSION
1. Make the correct diagnosis, to guide treatment
2. Ensure the safety of the mother and baby through careful monitoring
3. Achieve the birth of a mature newborn, not needing intensive / prolonged care

DIAGNOSIS
- Hypertension is a BP above 140/90mmHg
- By definition, this means two readings taken four hours apart, after rest, that are both above the threshold
- Ensure correct cuff used – if upper arm circumference is >33cm an obese cuff needs to be used to avoid over-reading the BP
- The diagnosis of pre-eclampsia usually requires proteinuria
  - Urine dipstix is the first step. Be aware that the quality of the dipstix varies by batch. **Check it yourself at least once** within first 24 hours
  - Remember that proteinuria can also be caused by a UTI or bilharzia – treat these and review the diagnosis.
  - The gold standard test for proteinuria is a 24 hour urine sample – this can be used for borderline diagnosis (abnormal is ≥300mg/24 hours)
  - For practical purposes a protein/creatinine ratio is much easier, especially if trace or 1+. This requires a clean catch sample.
  - A protein/creatinine ratio of above 0.034 is abnormal.
  - Borderline tests are worth repeating or confirming with a 24 hour urine collection.
  - If these tests are not available treat as pre-eclampsia if PIH and 1+ prot (not trace).
- Be aware that it is possible, although rare, to have pre-eclampsia without proteinuria. The diagnosis then rests on elevated blood pressure with other symptoms of severity, such as ALT more than twice normal, platelets of <100, pulmonary oedema, cerebral or visual symptoms.

IN OPD
- DO repeat the BP
- DO test the dipstix yourself
• Only start treatment if BP > 160/110 twice, 15 minutes apart
• Don’t do bloods yet, unless eclampsia, imminent eclampsia or BP 160/110 twice.
• To make sure of the hypertension diagnosis and need for treatment, admit to the ward for 24 hour observation, 4hrly BP and 12hrly dipstick.
• Hand over to ward doctor so they are aware of admission

IN THE WARD
• Check BP
• Confirm proteinuria and exclude UTI/Bilharzia
• If proteinuria confirmed, send urine PCR
• Repeat if borderline PCR and consider ZLE 24 hour urine PCR
• Only start BP meds if consistently high BPs
• Reminder: BP aim is 140/90. If less than 135/85 on two occasions, stop BP meds.

FURTHER INVESTIGATIONS
• Once a confirmed diagnosis of hypertension is made, do the following bloods:
  o Hb and platelets
  o Creatinine
  o ALT (don’t do a full LFT)
• If under 34 weeks, do Urea
• If platelets drop by >20 per week, or are under 100, do a FBC and peripheral blood smear to look for fragments (haemolysis)
• Baseline CTG
• Ultrasound for AFI, EFW, umbilical artery Doppler (within a few days)

BLOOD PRESSURE MANAGEMENT
• Management of blood pressure is important, but not the only aspect of this multi-organ disease:
  o Remember that 140/90mmHg is the target, so discretion is needed as to the exact number to treat. (If only marginally above 140/90 consider withholding treatment rather than drop it too low)
  o Definitely treat confirmed blood pressure of 150/100mmHg or above
  o For systolic BP 140-149 and diastolic 90-99mmHg, if you initiate treatment, do not drop below a systolic of 135-140mmHg or diastolic of 85-90mmHg
  o Reduce or stop treatment if BP < 135/85 on two occasions within 24 hours.
• Use drugs in stepwise fashion as follows:
  o Methyldopa 500mg bd (especially if not very high)
  o Methyldopa 500mg tds (start here for higher initial BPs)
  o Increase Methyldopa to 750mg tds
  o Add Amlodipine 5mg dly
  o Increase Amlodipine to 7.5mg dly then 10mg dly

MONITORING AND REVIEW

Gestational (PIH) & Chronic Hypertension
• Can be managed as an out-patient (if follow up is possible)
• Measure blood pressure and urine dipstick once a week at the clinic
• Encourage twice a week monitoring (at clinic is fine) beyond 36 weeks
• Should be referred back if BP increases or develops proteinuria.
• No need for repeat bloods etc, unless need re-admission or develop pre-eclampsia.

Pre-Eclampsia
• Check blood pressure 4 times a day. Once stable can be done twice daily.
• Kick chart three times a day
• CTG daily to start with. If non-stress test reactive and mom stable, do twice a week. Do if kick chart concerning.
• Umbilical artery dopplers at diagnosis and repeat if deterioration in mom’s condition or other new concerns (eg non-reassuring CTG).
• Repeat blood tests weekly as routine, but more frequently if deterioration.
• Repeat AFI every two weeks, but more frequently if deterioration.
• Do not repeat urine dipstix or protein-creatinine ratio as monitoring.
• U/S growth monitoring can be done every 3 weeks if any concerns

WHEN TO DELIVER
Gestational and Chronic Hypertension
• If PIH is well controlled on a single agent and no proteinuria develops, allow pregnancy to continue to term if no other indication for delivery.
  o Induce at 40 weeks
• If control inadequate or requiring two agents:
  o Induce at 38 weeks

Pre-Eclampsia with Stable Mother
• The decision about timing of delivery is based on “current assessment” after the mother has been stabilised.
NB: If the mother develops pre-eclampsia with signs of severity, refer to the next section, below. (See Management of Pre-eclampsia with Severe Features section)

• The initial goal is to attempt to get to at least 34 weeks
• Expedite delivery, including before 34 weeks, if signs fetal compromise
  Within 24 hours
  o Variable or late decelerations on NST
  o Reversed end diastolic flow
  o Suspected abruptio placenta
  o Intra-uterine death
  Wait 48 hours for steroids to take effect or deliver immediately at 34w0d
  o Severe fetal growth restriction (below 5th centile for gestation)
  o Repeated AFI under 5
  o Preterm labour or premature rupture of the membranes
• If the mother lacks other features of severity, but has the following, either expedite delivery, or refer. All cases to be discussed with a senior.
  o Creatinine >120 on two occasions
  o Platelets <100 (referral mandatory if HELLP)
  o If BP remains above 160/110mmHg despite two drug management
• For women who do not have any severe features, there was previously diverging opinion about expectant management up to 37w0d. A Lancet article published in 2019 suggests active management after 34 weeks results in significantly better maternal outcomes, with a trade-off that more infants required supportive care. SA Guidelines are coherent with this.
• The decision about when to deliver is dynamic and needs frequent reassessment. If 34 weeks is reached, management should be towards intervention, with proper counselling of the mother.
• Induction of labour in pre-eclampsia should be attempted using the standard IOL protocol (see proforma). Misoprostil is safe to use in pre-eclampsia.

BP CONTROL DURING LABOUR
• Give maintenance therapy as before
• Treat acute severe hypertension as above
• If BP remains uncontrolled, consider IV Labetalol

POSTPARTUM BLOOD PRESSURE MANAGEMENT
• Remember that complications, including eclampsia and stroke, are possible post-partum, including developing for the first time. Watch severe pre-eclamptics for 72 hours before discharge. (Blood pressure may only peak between day 3 to 6 post-partum.)
• Continue to control BP as close to the 140/90 target as possible. Do not discharge before there is evidence of control or near-control.
• First choice drug is a calcium channel blocker (amlodipine). Thereafter use ACE inhibitor (enalapril) or HCTZ. Methyl dopa can exacerbate post partum depression & mothers shouldn’t be discharged on this
• Patients with chronic hypertension need to continue their management
• Patients with pre-eclampsia need short-term treatment and then review by a doctor:
  • If only on one drug, give 4 weeks of treatment, followed by 2 weeks off and review at 6 weeks
  • If on two or more agents, continue for six weeks and then withdraw in a step wise fashion
  • Arrange weekly blood pressure checks at clinic for safety.

PREVENTION – ADVICE FOR FUTURE PREGNANCIES
• Calcium carbonate 1 tabs (500mg) BD (start in first trimester, no point in starting after twenty weeks)
  • Remember potential interaction with DTG and to separate dose from iron
• Aspirin 75mg daily in hx of pre-eclampsia, start after 12 weeks and up to 28wks. Some clinicians give aspirin therapeutically to anyone diagnosed with pre-eclampsia, even after 28wks, but there isn’t good evidence for this.

BLOOD PRESSURE MONITORING IN NON-HYPERTENSIVE WOMEN
• Women without a diagnosis of hypertension need:
  • Blood pressure on admission
  • Antenatal ward: Daily BP check
  • Labour ward: Four hourly blood pressure
  • Post-natal ward: Twice a day (six hourly post Caesar)
A NOTE ON UMBILICAL ARTERY DOPPLERS
(text acknowledgement: http://www.adhb.govt.nz)

- Abnormal umbilical artery waveforms are associated with histological evidence of reduced numbers of small placental blood vessels and therefore reflect "placental insufficiency". In pregnancies with reduced, absent or reversed end-diastolic velocity, there is an increased risk of stillbirth, asphyxia, chromosomal and congenital abnormality.
- Abnormal umbilical Doppler waveforms can be present weeks before there’s evidence of fetal compromise. They’re a marker of a high risk situation and should not normally be used in isolation as an indication for delivery.
- However, most obstetricians would consider delivering a fetus with absent end-diastolic velocity from about 32 weeks gestation following administration of corticosteroids.
- The use of umbilical artery Doppler studies in pregnancies with preeclampsia is associated with a 30% reduction in perinatal mortality. The likely reason for the reduced perinatal mortality is that the abnormal Doppler waveform highlights the at risk fetus who is then subject to more frequent surveillance ultimately resulting in timely preterm delivery.
- Please discuss abnormal results with a senior, or a friendly consultant.
Management of Pre-Eclampsia With Severe Features

Most morbidity and mortality related to pre-eclampsia occurs in women who exhibit severe features of the disease. It is critical that these patients are managed with careful attention to detail and in discussion with a senior, experienced doctor.

MANAGEMENT OF ACUTE SEVERE HYPERTENSION

- If sBP≥160 or dBP≥110mmHg on two occasions 10-15minutes apart, give 10mg nifedipine capsule orally
- Repeat BP after 20 minutes and repeat dose if needed. Doctor should be called at this stage
- A labetalol infusion is required if not controlled with nifedipine
- Start methyldopa (aldomet) at the same time but remember that it takes a long time to start working. (It should therefore not be given as a stat dose to control a BP spike.)
- It is important to avoid excessive fluid loading to prevent pulmonary oedema.

MANAGEMENT OF IMMINENT ECLAMPSIA

- Features of Imminent Eclampsia are
  o Severe or unremitting headache
  o Visual disturbances
  o RUQ or epigastric pain
  o Ankle clonus or extremely brisk reflexes
  o Altered mental state
- Women with signs of imminent eclampsia are extremely ill.
- They must be managed in a high care area and all cases discussed with a senior.

1. Start magnesium sulphate (see box)

### Magnesium sulphate

- Give 4g loading dose of MgSO₄ mixed in 200ml of NaCl 0.9% ("normal saline") or 5% dextrose and run it over 20 minutes. (600ml/hr through a rate minder if available)
- An extra 2g MgSO₄ can be repeated twice IVI if required. (Slowly administered as above.)
- Give 5g MgSO₄ IMI in each buttock immediately.
- Then prescribe 5g MgSO₄ IMI every four hours in alternate buttocks for 24 hours after delivery or after the last fit

Note: If there is doubt about the diagnosis, it may be prudent to treat, but then to review the decision about delivery. This must be discussed with a senior! (Where the diagnosis is not in doubt, do not let your guard down simply because the symptoms improve with management, however!) Continue with BP and blood monitoring regardless.
2. **Manage the blood pressure (see box)**

- If the BP remains ≥ 160/110mmHg despite magnesium load give 20mg of Nifedipine orally
- If unable to take oral meds, or BP remains high, use Labetalol IVI to reduce BP slowly.
- Replace 20ml of a 200ml bag of NaCl 0.9% (“normal saline”) with 20ml (200mg) Labetalol, making a 1mg/ml solution.
- Run infusion through a rate minder titrated against response.
- Maximum rate is 1mg per minute

3. **Monitor closely**

- Take urgent bloods for CU&E, FBC, LFTs
- If you cannot do bloods consider the implications of not knowing and strongly consider transfer
- Monitor BP every 15 minutes at first, then hourly once stabilised.
- Ensure urine output is monitored HOURLY. Urine output must be at least 30ml per hour (0.5ml/kg/hr). If it falls below this, reduce the dose or stop administering MgSO₄.
- Monitor reflexes. If long tendon reflexes are lost, reduce the dose or stop administering MgSO₄.
- **NB:** Repeat full bloods again 4 hours after delivery

4. **Make a delivery plan**

- Ultimately, management of pre-eclampsia with severe features requires delivery of the baby.
- As a guide:
  - In imminent eclampsia, delivery within 24 hours of loading with magnesium sulphate, so start induction or make the appropriate delivery plan
  - In eclampsia, delivery within 6 hours if possible. This is the target ideally, but given the potential hazards of C/S, delivery within 12-24 hours is acceptable if mother and baby are stable. (Discuss with a senior.)
  - Caesarean section needed if fetal distress or cervix unfavourable for induction. (Must be done under general anaesthesia.)
  - Vaginal delivery if mother in labour or cervix favourable for induction (augment with oxytocin if necessary)
  - Vacuum extraction may be necessary in the second stage.

Do not use ergometrine or syntometrine in the third stage of labour.
5. **Decide re transfer**

The decision as to whether and if so, when, to transfer a patient with severe pre-eclampsia can be a difficult one. The primary consideration is maximising the chances of good maternal and fetal outcomes. This can often be achieved at a district hospital, but you should always refer the following (timing may still need to be discussed with a senior):

- Pulmonary oedema
- HELLP syndrome
- DIC
- Early onset pre-eclampsia (before 30 weeks)
- Any patient with eclampsia if
  - the woman remains unconscious or has any lateralising signs
  - the woman has renal or hepatic failure or pulmonary oedema
  - you are unsure you can perform safe general anaesthesia

### Eclampsia – Additional Management Points

The above protocol for severity applies, but approach eclampsia as you would any resuscitation:

**Immediate management**

1. Call for help, including a doctor
2. Turn woman into left lateral position
3. **Check airway.** Ensure good position and suction secretions. Use oropharyngeal airway if necessary.
4. Give oxygen.
5. Prevent injuries – ensure a safe environment.
6. Obtain IV access early.
7. Start **magnesium sulphate** (see box above)
8. If convulsions persist despite magnesium sulphate load and additional doses, give Clonazepam 1mg IV over 5 minutes.
9. Insert indwelling **urinary catheter**.

**Further management**

1. Control the **blood pressure** (see box above)
2. Monitor BP every 10 minutes at first, then hourly once stabilised.
3. Assess fetal condition with CTG and fetal size by ultrasound
4. Take blood for CU&E, FBC, LFTs
5. Continue IV fluids (Ringer’s Lactate or Normal Saline) at 80ml/hr
6. Decide how and where to deliver baby (see box above)
7. Observe closely for at least 24 hours
   - a. Monitor blood parameters
   - b. Watch for signs of magnesium sulphate overdose
8. Do not discharge from hospital for at least three days (see above).
Preterm Labour Drugs

Rationale
The purpose of this policy is not to outline the management of preterm labour, which can be obtained from an obstetric textbook, but rather to standardise the use of medication in preterm labour. The reason for this is to ensure a measure of continuity of care and create a standard that midwives can become familiar with despite different doctors overseeing maternity.

Indications
- The cut-offs of 34 weeks or EFW of ≥2000g are universally accepted. Do not tocolyse or give steroids above this or, conversely, if the fetus is not viable.
- Ensure there is no fetal distress or other contraindication to tocolysis before proceeding.

Tocolytics
Role: The role of tocolytics is to allow time for steroid use or transfer to a better equipped facility. They have no proven benefit on their own.
Drug: Current literature suggests that the choice is between atosiban and nifedipine. The former is expensive and not available to us. Other options are β-agonists or indomethacin. They are not as effective and have less favourable side effect profiles. We therefore use Nifedipine, unless there are specific contra-indications, one of which is systolic BP less than 100mmHg.
Dose: Give Nifedipine 30mg capsules PO stat, followed by 20mg eight hourly starting one hour later.
If < 32 weeks and nifedipine contraindicated, give Indomethacin 50mg stat, followed by 25mg 4hrly for up to 48 hours.

Steroids
Role: Steroids have been proven to improve neonatal outcome when used before 34 weeks gestation.
Drug: Betamethasone has been shown to be the best option, but is only recently available to us and may not always be present.
Dose: There are different accepted regimens. For ease of administration please choose between:
Betamethasone 12mg IMI twelve hourly for two doses OR
Dexamethasone 8mg IMI eight hourly for a total of three doses

Antibiotics
Role: Antibiotics have no proven role in preterm labour, unless there is an obvious source of infection or membranes have been ruptured for longer than 24 hours. However, many clinicians feel that preterm labour may be the result of sub-clinical infection and consider their use justified. Preterm prelabour ROM should get 10 days antibiotics
Drug: Use Amoxicillin and Metronidazole. AVOID Augmentin.
Dose: Amoxicillin 500mg eight hourly and Metronidazole 400mg eight hourly, both orally.
Neuro-protection

- Use MgSO4 for the neuroprotective value for the fetus IF GESTATION < 32 WEEKS
  - Use it when delivery is imminent (the ideal is 6 to 12 hours before, must stop after 24hrs). Do not use if you are not sure that the woman is at high risk of imminent delivery
  - Give 4g loading over 20 minutes and then 1g/hour maintenance

Please feel free to discuss the management of any patient in preterm labour with a senior doctor.

Rhesus negative mothers

- Prevalence of Rhesus-negative mothers varies around the country – at Zithulele it is fairly low.
- All mothers should have blood sent for “Anti-D antibodies” at 28 and 34 weeks’ gestation
  - Request this on the Blood Bank form, with a note in comments
  - You must add the patient’s ID number on the form
  - Follow up the result by phoning the Blood Bank with the ID number
- If maternal blood positive for Anti-D antibodies, needs ultrasound scan to check baby for hydrops. Discuss management with a specialist.
- Many first world guidelines suggest prophylactic anti-D to be given at 28 and 34 weeks’ gestation. SA EDL suggests giving it after “potentially sensitising events”. Dose is 100mcg IM stat.
- At birth, the cord blood should be sent to the Blood Bank for a Coomb’s test
  - If Rh negative, no treatment is necessary
  - If Rh positive and Coomb’s negative, give Anti-D IgG 100mcg IM stat to mom
  - If Rh positive and Coomb’s positive, discuss with neonatologist
Management of Preterm Pre-labour ROM (PPROM)

Management principles

- When ROM is suspected, it should always be confirmed: History is important (pool of water on the ground vs wetness on legs), ferning on slide, speculum to visualize draining fluid, pH test, U/S for AFI.
- Monitoring:
  - Baby: CTG as usual. At least daily.
  - Mother: Exclude chorio-amnionitis at initial presentation and daily monitoring thereafter (5-point chorioamnionitis screen: maternal fever, abdominal pain, foul smelling d/c, maternal and fetal tachycardia). WCC and CRP weekly. (Umbilical doppler not worthwhile unless IUGR present.)
- Remember that a history of PPROM is a strong risk factor of recurrence in future pregnancies.

PPROM (ROM with no signs of labour before 37w0d) broken into 2 groups:

**PPROM: 26w0d to 33w6d (lung maturity is main issue):**

- Steroids:
  - Betamethasone IM 12mg 12hly x2
  - Consider a rescue dose of 12mg if it has been >14 days since last dose, gestation is still <34 weeks and the delivery is expected in the next 7 days.)
- Antibiotics:
  - Azithromycin 1g PO stat PLUS
  - Ampicillin 2g 6hly IVI x 48h THEN Amoxicillin 500mg tds PO x 5/7 +
  - Metronidazole 400mg 8hrly PO
  - (Note, we do not have Erythromycin, currently in SA protocol)
  - If Penicillin allergy: Azithromycin 1g PO stat PLUS Cefazolin 1g tds IV for 48h THEN cefalexin 500mg 6hly PO 5/7.
- Tocolysis:
  - Aim to delay labor for 48h.
  - Contra-indicated after 48h, if > 4cm cervical dilation, signs of chorioamnionitis or fetal distress.
  - If she goes into labour after tocolysis is stopped, continue with delivery. (No further tocolysis.)
- Thromboprophylaxis indicated for duration of admission. (Clexane)
- Meconium stained liquor in absence of signs of chorioamnionitis is NOT an indication for intervention.
- PPROM in singleton and twin pregnancies are managed the same.
- Patient must be hospitalized for the entire period.
- Use MgSO4 for the neuroprotective value for the fetus IF GESTATION < 32 WEEKS
  - Use it when delivery is imminent (the ideal is 6 to 12 hours before, must stop after 24hrs). Do not use if you are not sure that the woman is at high risk of imminent delivery
  - Give 4g loading over 20 minutes and then 1g/hour maintenance
PPROM: 34w0d to 36w6d (the focus is now on optimal timing of delivery)
- When we get to 34 weeks, lung maturity is not the issue anymore. Both expectant management (until 37+0 weeks) and delivery are reasonable.
  - For optimally dated pregnancies >34w0d, UpToDate suggests delivery.
  - If unsure dates, to wait for 37 weeks. (NMAH allow PPROM pregnancies with no risk factors to progress to 37w before delivery.)
  - Expectant management requires the informed consent of the mother.
- If there are any signs of chorioamnionitis, abruptio placentae or cord compression takes place, delivery is indicated.
- No antibiotics (if it is indicated, delivery is probably also indicated), no tocolysis, no steroids.
  - If patient goes into labor, allow to progress. No tocolysis after 34w.
- Induction in PPROM: PV to determine Bishop score: >5 with Oxytocin, <6 can start with misoprostol to ripen the cervix.

Management of Pre-labour ROM (PROM)

Management principles
- See Management principles under PPROM above

PROM (ROM after 37w0d with no signs of labor)
- Avoid antibiotics, unless prolonged ROM (>18h) or chorio-amnionitis suspected. If >18hrs ROM and delivery not imminent, give:
  - Ampicillin 1g IVI 6-hourly
  - PLUS Metronidazole 400mg PO 8-hourly
- After 37 weeks we must deliver the baby.
  - If you see a patient with PROM (implying she is >37w and is NOT showing signs of labor) that ruptured membranes >1h before, start oxytocin immediately. No need to wait and see.
  - We prefer to give oxytocin during the day shift. (What does this mean for Zithulele PRACTICALLY? Start IOL as soon in the day as possible and consider stopping at 19:00. If patient arrives during the night, it is fair to wait for morning round, but handover from night doctor can assist earlier initiation of induction.)
Chorioamnionitis

Chorioamnionitis is an important, though often under-diagnosed, cause of perinatal death. Awareness, prevention and the correct management is important to minimise harm.

Important basics to remember
1. **Correct dates.** (Take a careful history, plot the SFH accurately, arrange an early ultrasound.) Knowing the duration of the pregnancy as accurately as possible assists with better decision making, especially when decisions around intervention need to be made in the preterm period.
2. **HIV.** Ensure that all women are tested for HIV and treated appropriately, ensuring VL suppression.
3. **Treat UTIs and STIs** that present during pregnancy, and investigate recurrent or resistant infections. Plan appropriate follow up to check that the infection has resolved. Advise partner treatment for STIs. Don’t forget to treat for *Candida* where necessary.

Prevention
1. All women should be reminded antenatally about the importance of a **timely response to decreased fetal movements**
2. All women with **preterm pre-labour rupture of membranes** which is being managed expectantly, should receive antibiotics. See here. Note: This is Preterm Prolabour ROM prophylaxis, not the treatment of chorioamnionitis, which is below
3. Minimise the number of vaginal examinations performed, especially in pre-labour rupture of membranes or prolonged latent phase AND clean the perineum appropriately before each examination.

Making the diagnosis

Presumptive diagnosis
- **Maternal fever** >39˚C once or >38˚C twice **plus**
  - Baseline fetal tachycardia >160 for >10min **or**
  - Maternal WCC >15 (without steroids) **or**
  - Purulent fluid from os

A confirmed diagnosis requires amniocentesis or histology, which are usually not possible in our setting.

Maternal tachycardia and uterine tenderness have been de-emphasised in diagnosis but may provide additional clues. It is always, necessary, however, to consider other possible causes, unless the diagnosis is confirmed. (Differential of abdominal pain and fever should include: UTI, appendicitis and pneumonia. Pain without fever may be colitis, round ligament pain or placental abruption, among others)

Nonetheless, remember too that histologically diagnosed chorioamnionitis is three times more common than clinical chorioamnionitis.
Causative organism
Knowing the causative organism is not necessary before treating chorioamnionitis. When membranes are intact, the most likely organisms are *Ureaplasma* and *Mycoplasma*. Other organisms which ascend from the vaginal tract are *Gardnerella*, *Group B* streptococcus and *E.coli*. These are more likely when the membranes are ruptured.

Management
1. **Make sure of the diagnosis.** Remember that diagnosing chorioamnionitis has implications for the continuance of the pregnancy. Make sure you can justify your decision and ask if you are not sure. Please send a Urine MC&S (it’s the most common alternative diagnosis).
2. **Delivery.** Generally, a diagnosis of chorioamnionitis is considered an indication for delivery. This should be attempted vaginally, unless contraindicated for another reason, to avoid the additional complications related to caesarean birth. If the diagnosis is sub-clinical or only suspected and the baby is preterm, you may consider steroids to mature the lungs, but mother and baby need careful monitoring.
3. **Hydration** of the mother
4. **Antibiotics.** Ampicillin 1g IV 6 hourly plus Gentamycin 5mg/kg IV daily plus Metronidazole 400mg PO 8 hourly, until delivery, with a single dose of IVs after delivery is usually considered sufficient, treating >95% of infections. Recommendation is based more on consensus than evidence. Interestingly, this does not cover for *ureaplasma* organisms, but the addition of macrolide antibiotics has not shown additional benefit. Note: Gentamycin is in most protocols, but is potentially ototoxic to baby (most do not suffer harm). If delivery is imminent you may wish to withhold it.
5. **CTG monitoring** of baby if gestationally appropriate.

Complications
**Maternal complications**
Women with chorioamnionitis are at risk of endomyometritis, wound sepsis and PPH. Other, more serious, complications are rare. Appropriate advice and follow up is essential. Post-Caesarean section antibiotics are usually indicated.

**Fetal complications**
 Babies born to moms with chorioamnionitis have an increased chance of sepsis, pneumonia and death. Risks are higher in the preterm infant so these need especially close monitoring.
Induction of Labour

Policy
1. Induction of labour is indicated where there is evidence that continuing with the pregnancy will result in the morbidity or death of either mother or baby.
2. Induction of labour also indicated where there is intra-uterine death (IUD): if spontaneous labour does not occur within 2-4 weeks, where the IUD is a threat to the mother (e.g. DIC, sepsis), or the patient requests it.
3. Inductions (via misoprostol) carried out for non-urgent indications should be started as early as possible in the day, not after 10h00. (Avoid inductions after hours or weekends, so suggest starting at 04h00, stop 19h00.) Preferably not more than 2 inductions going per day.
4. Once started, the decision to delay or postpone an induction should be made in consultation with senior.
5. The potential for foetal distress means that the mother must be told about the possibility of a Caesarean section.

Induction of labour
A. First Trimester (0-14 weeks): See page on Management of Miscarriage
B. Second Trimester (15-26 weeks): Usual indication is intra-uterine death. Misoprostol 200µg 4hly until delivered. If after 24h or the next morning on round not in labour, consider adding balloon catheter (if Bishop score ≥8) while continuing misoprostol. Do a D&C if incomplete or severe bleeding, since products too bulky for MVA curettes.
C. Third Trimester after (>26 weeks):
   Evidence: There are numerous studies which have used a wide range of misoprostol doses as well as balloon catheter as induction methods. Using them together results in a significant reduction in failed inductions (from 21.2% down to 9.3%) compared with misoprostol-alone inductions. We use 50µg given four hourly in primigravida, but start multigravida on two doses of 20µg given two-hourly before moving to the 50µg dosing. A balloon catheter should be inserted once the Bishop score is ≥8.

Procedure
1. Please use the Induction of Labour proforma for all inductions.
2. All mothers being induced should be monitored with a CTG once contractions begin. (12hly if not in labour, 4hly once contractions has started.)
3. In general, the doses on the proforma should be given between 04h00 and 17h00, but not overnight. Please fill in the date and times you want it given.
4. A CTG should be done for 10 minutes before and after each dose of misoprostol
5. Daily review of induction mandatory. Is the indication sound – is a Caesar now necessary? Is the pregnancy intra-uterine?
6. Add a balloon catheter once Bishop score ≥8
7. Do AROM once balloon passed, unless contraindicated
8. Stop misoprostol once contractions start.
9. If no contractions one hour after AROM, start oxytocin.
10. Patients should be started on a partogram once membranes rupture or dilatation reaches 4cm.
Remember
- Ensure good analgesia (Morphine/Pethidine) when in labour, especially if patient has intra-uterine death
- Contra-indications for misoprostol: Previous Caesarean section and grand-multipara (5 or more previous deliveries of 26 or more weeks’ gestation). Do balloon dilatation and AROM when catheter passed.

If no progress in previous caesarean section after 12h:

<table>
<thead>
<tr>
<th>Previous C/S &lt; 24 weeks</th>
<th>Previous C/S &gt; 24 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start on misoprostol protocol</td>
<td>Do caesarean section</td>
</tr>
</tbody>
</table>

- Never actively rupture membranes (AROM) in an intra-uterine death (IUD) that is not in labour (with exception of a clinical abruption placentae.)
- If patient is HIV+ and virally suppressed, AROM may be considered. If VL high or unknown, rather defer rupture of membranes until delivery expected within next 4 hours.

Overstimulated uterus
- The biggest risk with use of misoprostol is over stimulating the uterus. The result is foetal distress, usually due to too much contractions (>5 contractions/minute).
- If overstimulated/foetal distress, start intra-uterine resuscitation immediately:
  1. Turn on left side
  2. Stop contractions (Need tocolytic: Salbutamol IV (500μg ampule, dilute to 10 mls, give 5ml slowly IV (250μg), keep rest for when contractions restart. This gives you time to get to theatre.)
  3. Give O2 to mother.

Previous Caesarean section
- Practical realities dictate that most women with a single previous C/S should be encouraged to attempt vaginal birth after C/S (VBAC) if there are no contraindications. Counselling needs to be done carefully so as not to unnecessarily drive up C/S rates (and create risks in future pregnancies. Explain the intention, potential risks of both VBAC and C/S and expected course of labour. Document your discussion.
- Notwithstanding the above, a woman with a single previous C/S who reaches 40 weeks completed gestation, should be induced, or have an elective C/S, as neonatal risks increase beyond this point and may complicate an already difficult decision.
- Women who need an elective repeat C/S after a single previous C/S should have this done between 39+0 and 39+6 where possible. After multiple previous C/S, where the risks of rupture start to increase, it is reasonable to do this from 38+0.
CTG Analysis Guide
CTG interpretation can be challenging and inter-observer variation even among specialists familiar with international guidelines is a well-documented phenomenon. This guide is taken almost verbatim from the NICE guideline, dated April 2019, which is hereby acknowledged. It is intended to standardize the interpretation of CTGs across the team, but remember, the CTG should never be interpreted in isolation from the patient.

For reasons of style and space the following important aspect has been omitted from the many locations it is repeated in the NICE guideline, but it nonetheless important:
• Talk to the woman and her birth companion(s) about what is happening and take her preferences into account.

Overall care
• Make a documented systematic assessment of the condition of the woman and unborn baby (including cardiotocography findings) hourly, or more frequently if there are concerns.
• Do not make any decision about a woman’s care in labour on the basis of cardiotocography findings alone.
• Take into account the woman's preferences, any antenatal and intrapartum risk factors, the current wellbeing of the woman and unborn baby and the progress of labour.
• Ensure that the focus of care remains on the woman rather than the cardiotocography trace.

Assess the CTG trace
Remember the following important additional aspects:

• Baseline fetal rate
  • differentiate between fetal and maternal heartbeats
  • baseline fetal heart rate will usually be between 110 and 160 beats/minute
  • although a baseline fetal heart rate between 100 and 109 beats/minute is a non-reassuring feature, continue usual care if there is normal baseline variability and no variable or late decelerations.

• Baseline variability
  • baseline variability will usually be between 5 and 25 beats/minute
  • intermittent periods of reduced baseline variability are normal, especially during periods of quiescence (‘sleep’), or after drugs such as MgSO4.

• Presence or absence of decelerations, and concerning characteristics of variable decelerations if present (see decelerations)
  • When describing decelerations specify:
    o their timing in relation to the peaks of the contractions
    o the duration of the individual decelerations
    o whether or not the fetal heart rate returns to baseline
    o how long they have been present for
    o whether they occur with over 50% of contractions
• the presence or absence of a biphasic (W) shape
• the presence or absence of shouldering
• the presence or absence of reduced variability within the deceleration.

• Describe decelerations as 'early', 'variable' or 'late'. Do not use the terms 'typical' and 'atypical' because they can cause confusion.

• Regard the following as concerning characteristics of variable decelerations:
  o lasting more than 60 seconds
  o reduced baseline variability within the deceleration
  o failure to return to baseline
  o biphasic (W) shape
  o no shouldering.

• If variable decelerations with no concerning characteristics are observed:
  o be aware that these are very common, can be a normal feature in an otherwise uncomplicated labour and birth, and are usually a result of cord compression
  o ask the woman to change position or mobilise.

• Remember that early decelerations are uncommon, benign and usually associated with head compression. If there are no non-reassuring or abnormal features they should not prompt further action.

• The longer and later the individual decelerations, the higher the risk of fetal acidosis (particularly if the decelerations are accompanied by tachycardia or reduced baseline variability).

• Accelerations
  • the presence of fetal heart rate accelerations, even with reduced baseline variability, is generally a sign that the baby is healthy
  • the absence of accelerations on an otherwise normal cardiotocograph trace (see the table description of cardiotocograph trace features) does not indicate fetal acidosis.

Principles for intrapartum cardiotocography trace interpretation
• When reviewing the cardiotocography trace, assess and document contractions and all 4 features of fetal heart rate: baseline rate; baseline variability; presence or absence of decelerations (& concerning characteristics of variable decelerations* if present); presence of accelerations.

• If it is difficult to categorise or interpret a cardiotocography trace, obtain a review by a senior midwife or a medical officer.

Categorise the CTG trace
Categorise cardiotocography traces as follows:
• Normal: all features are reassuring (see description of cardiotocograph trace features table)
• Suspicious: 1 non-reassuring feature and 2 reassuring features (but note that if accelerations are present, fetal acidosis is unlikely)
• Pathological:
  o 1 abnormal feature or
  o 2 non-reassuring features.
Preferably, use the table provided in the Maternity Case Record:

<table>
<thead>
<tr>
<th>INDICATION</th>
<th>MATERNAL PULSE</th>
<th>DD/MM/YYYY</th>
<th>HI/MM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>110-160 bpm</td>
<td>□</td>
<td></td>
</tr>
<tr>
<td>Variability</td>
<td>5-25 bpm</td>
<td>□</td>
<td></td>
</tr>
<tr>
<td>Decelerations</td>
<td>No repetitive* decelerations □</td>
<td>Lacking at least one characteristic of normality, but no pathological features □</td>
<td>Reduced (&lt; 5 bpm) variability &gt;50 minutes □</td>
</tr>
<tr>
<td>Interpretation</td>
<td>Fetus with no hypoxia</td>
<td>Low probability of hypoxia</td>
<td>Fetus with high probability of hypoxia/acidosis</td>
</tr>
<tr>
<td>Contractions</td>
<td>None □</td>
<td>Irregular □</td>
<td>Regular □</td>
</tr>
<tr>
<td>Clinical management:</td>
<td>No intervention necessary □</td>
<td>Action to correct reversible causes if identified □</td>
<td>Immediate action to correct reversible causes □</td>
</tr>
</tbody>
</table>

I have explained the nature of the findings and planned action to the person and her birth companion □

**Evaluation done by:**

---

**Make a management plan**

1. **Call for help if you’re unsure.** A second opinion, from medical officer or senior midwife is helpful to obtain and document.

2. **For a normal trace - Keep watching.** If normal after 20 minutes, return to intermittent auscultation or continue CTG tracing.

3. **For a suspicious or pathological trace - Conservative measures.** If the trace is suspicious or pathological, there are concerns about the baby’s wellbeing. Be aware of the possible underlying causes and start one or more of the following conservative measures based on an assessment of the most likely cause(s):
   a. encourage the woman to mobilise or adopt an alternative position (and to avoid being supine)
   b. offer intravenous fluids if the woman is hypotensive
   c. reduce contraction frequency by:
      i. reducing or stopping oxytocin if it is being used and/or
      ii. offering a tocolytic drug (e.g. salbutamol 100mcg IV)

4. **For a pathological trace - further interventions.** Additional steps are necessary for pathological traces:
   a. exclude an acute event (cord prolapse, suspected placental abruption or suspected uterine rupture)
   b. make preparations for an urgent birth if not improving on conservative measures. Expedite the birth if the acute bradycardia persists for 9 min.
   c. obtain a further review by a senior if possible
   d. offer digital fetal scalp stimulation (see below) and document the outcome.
e. If the cardiotocograph trace is still pathological after fetal scalp stimulation, consider expediting the birth

5. Fetal scalp stimulation. If the cardiotocograph trace is pathological, offer digital fetal scalp stimulation (during vaginal examination). If this leads to an acceleration in fetal heart rate, this is generally a sign that the baby is healthy but should not be reason to disregard the other features of the trace. Review the whole clinical picture

6. “Intrauterine fetal resuscitation” Do not use maternal facial oxygen therapy for intrauterine fetal resuscitation, because it may harm the baby (but it can be used where it is administered for maternal indications such as hypoxia or as part of preoxygenation before a potential anaesthetic) [Note: SA guidelines still suggest oxygen, but this is outdated. Recommendation against oxygen checked in writing with senior respected obstetricians.] Do not offer amnioinfusion for intrauterine fetal resuscitation.

Analgesia in Labour

Rationale:
Labour is an extremely painful experience. It is often very frightening as well, especially for primigravidas.

Providing a good maternity service includes providing reasonable analgesia during labour. Good analgesia results in:
1. Happier, more satisfied patients.
2. Better progress of the first stage of labour.
3. Less exhaustion with better maternal effort second stage.
4. Less likelihood of complicated delivery.

Methods of analgesia:
All patients should be offered analgesia in the following forms:
1. Education about what labour and delivery entails.
2. Encourage proper breathing during contractions
3. Allow and encourage the presence of a relative during labour.
4. Intramuscular opioid analgesia for patients early in active labour.

IM Opioid
- Any patient who is 4cm, 5cm or 6cm dilated (active labour) should be offered intramuscular Opioid. Consult with a doctor before giving it to patients who are less than 4cm or more than 6cm dilated.
- Our preference is for Morphine 5mg IM.
- If Morphine is given it should be recorded clearly on the partogram and in the patient’s notes (and in the scheduled drug register).
- A doctor need not sign for the Morphine before it is given, but should countersign the prescription at the first opportunity thereafter.
Augmentation of Labour with Oxytocin

If labour needs to be augmented, oxytocin (syntocinon) is an extremely effective option, but it needs to be used carefully. Please write it up using this proforma, replicated here because it outlines contraindications, precautions and rates.

### AUGMENTATION OF LABOUR WITH INFUSION OF OXYTOCIN

**PATIENT’S NAME:** __________________________  **DATE:** ______________

Oxytocin infusions are indicated for the augmentation of labour where progress is slow due to poor contractions.

**Doctor please check and confirm:**

- [ ] There is no evidence of fetal distress
- [ ] There is no current evidence of CPD
- [ ] The woman has not delivered more than 4 children
- [ ] The woman has not had a previous Caesarean Section
- [ ] The progress of labour has been plotted at least two hourly on a partogram
- [ ] There is capacity for the Fetal Heart to be monitored using CTG (unless IUD)
- [ ] The membranes are ruptured where possible

**PRESCRIPTION**

1. Add **10 units** of Syntocinon to **1 litre** of Normal Saline (NaCl 0.9%) or Ringer’s Lactate.
2. Use a rate minder (infusion pump) to ensure correct infusion rate.
   [NB: Ensure giving set is run through with synto solution!]

<table>
<thead>
<tr>
<th>Instruction</th>
<th>Rate m/l per hour</th>
<th>Time to do it</th>
<th>Midwife</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Time carried out</td>
<td>CTG still reactive?</td>
</tr>
<tr>
<td>Start infusion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase* rate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase* rate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase* rate</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* do not increase infusion rate if woman getting good contractions

**Midwife, call the doctor if:**

1. There are signs of fetal distress (decelerations on the CTG)
2. The patient is getting more than 4 contractions in 10 minutes
3. Progress of labour is less than 1cm of dilation per hour.

**Note to doctors:**

Dosing, rate and rate of increase of the infusion varies depending on the assessment of the individual patient. Protocols vary from starting doses as low as 1mU/min to 6mU/min. (1mU/min = 6mU/hr) In general it is safest to start low and increase the dose. If there are good contractions and progress, maintain the dose. Use this chart as a guide, but discuss with a senior if you are unsure.

<table>
<thead>
<tr>
<th>Status</th>
<th>Starting rate</th>
<th>After 30 min</th>
<th>After 60 min</th>
<th>After 90 min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primigravida</td>
<td>15 mU/hr</td>
<td>30 mU/hr</td>
<td>60 mU/hr</td>
<td>90 mU/hr</td>
</tr>
<tr>
<td>Multiparous</td>
<td>6 mU/hr</td>
<td>12 mU/hr</td>
<td>24 mU/hr</td>
<td>48 mU/hr</td>
</tr>
</tbody>
</table>

**Dr’s Name:** __________________________  **Midwife managing case:** __________________________

**Dr’s Signature:** __________________________  **Midwife signature:** __________________________

Updated 20/11/2020
Safety Rules for the Second Stage of Labour

The second stage of labour is one of the MOST DANGEROUS times in your life. Managing the second stage well is important to prevent death and disability (and medico-legal consequences).

Textbooks give wide ranges of “acceptable limits.” Together with the wide range of experience in labour ward at any given time, this can cause confusion as to how to proceed safely, if baby is not delivered immediately. As a result, we have developed this guidance. We suggest making them compulsory for all doctors and midwives.

When a woman is assessed as fully dilated and she has no urge to bear down:
1. A midwife may decide to wait up to 30 minutes IF THEY ARE COMPLETELY SATISFIED with the condition of the baby (and mother).
   a. If the midwife is at all worried about the baby they must call a DOCTOR immediately.
   b. Doctors who are concerned or unsure as to how to proceed must call a SENIOR
2. After 30 minutes if there is still no urge to bear down, the midwife must call a doctor, even if the baby appears to be doing OK.
3. Oxytocin should NOT be used in the second stage of labour unless:
   a. Labour was augmented with oxytocin (i.e. it may be continued)
   b. On the advice of the Senior doctor on call

When a woman is bearing down:
1. A primigravida may bear down for 30 minutes. If delivery is not imminent (expected within the next 2 pushes or 5 minutes) a doctor must be called, regardless of the state of the baby.
2. A multigravida may bear down for 20 minutes. If delivery is not imminent (expected within the next 2 pushes or 5 minutes) a doctor must be called, regardless of the state of the baby.
3. If you are concerned about the state of the baby, a doctor should be consulted during the second stage (they must record their opinion as to best plan for delivery) and the doctor should be immediately available in case the baby is born flat. (If the doctor on call is busy with something else, a plan as to who to call should be discussed with them before the delivery happens.)

Preparation for resuscitation
It is the responsibility of the midwife to ensure that resuscitation equipment is immediately available. Failure to ensure that a working bag and mask, laryngoscope and suction is available at all deliveries, but especially difficult ones, is considered negligence.
Episiotomies in Labour Ward

Remember:
1. Episiotomies are not necessary in every woman! Even primigravidas can usually deliver without an episiotomy.
2. Tears are best avoided by supporting the perineum during delivery of the head, not by episiotomies. Episiotomies have not been shown to prevent tearing.
3. Episiotomies should be explained to the woman before the scissors are in your hand!
4. Local anaesthetic is ALWAYS necessary when cutting an episiotomy. Use 10ml of 1% lignocaine.

Episiotomies should be done only when:
1. Assisted delivery is being done (i.e. vacuum)
2. Delivering a breech vaginally
3. The perineum is unusually tight and impeding progress at the end of the second stage of labour.

Technique:

Repair
1. Inspect for any tears. Be sure to recognise third degree tears (involving anal sphincter). Third degree tears need repair in theatre.
2. Repair carefully in layers using chromic 2-0. Try use buried knots on perineal skin.
3. Call for senior help if you are unsure.
4. Educate the woman about Sitz Baths to keep wound clean and prescribe analgesia.
As Baby Is Born

Unless the baby needs immediate resuscitation, two things should happen with all newborns. They are evidence based and lead to better long-term outcomes:

1. Delayed cord clamping. Wait between 1 and 3 minutes before clamping the cord. A simple delay is preferable to milking the cord.

2. Early skin-to-skin contact with mom. Warn her beforehand that you will put the newborn baby on her chest after briefly drying her/him. This promotes bonding and breastfeeding.

Post-Partum Haemorrhage (PPH)

This is not a comprehensive monograph on PPH (see Prof Fawcus’s excellent work here) but only a reminder as to the approach we use at Zithulele, known as EMOTIVE.

E Early detection. 500ml is less than you realise. Use the calibrated drape, but if not available, implement the package of care earlier, rather than later.

M Massage the uterus

O Give 10u oxytocin IM. If already given and still bleeding, consider syntometrine (oxytocin plus ergometrine) 1 amp stat and an oxytocin infusion (20u in 1 litre Ringers)

T Tranexamic acid. 1g IV stat

IV Get good IV access and run the fluids. (18G minimum, preferably 16G and two lines)

E Examine the genital tract for tears.

Escalate by calling a senior

Extra measures, which may include:
  - Balloon tamponade
  - Pneumatic antishock garment
  - Blood transfusion
  - FDP administration
  - Surgical intervention
Preparation for Caesarean Sections
Preparation for Caesarean section should include:

- Consent. If woman <18yr, a parent or guardian should give consent, or the Clinical Manager.
- Antibiotic prophylaxis. Use Cefazolin IV stat (If <80kg use 1g, >80kg use 2g). If Cefazolin is unavailable, the easiest substitute is Gentamycin 5mg/kg, plus Metronidazole 500mg, both stat IV.
- Metoclopramide 10mg IV stat to aid gastric emptying.
- Sodium citrate 30ml PO, if available, to reduce gastric pH.
- At least one 18G IV cannula
- Urinary catheter

Red-top clotting test
aka Lee-White test

The reality of rural hospitals is that we sometimes manage patients at risk of coagulopathy, with no ability to confirm this in the laboratory before needing to make decisions about their management.

The first step is to identify the risk. The most common causes of a coagulopathy are:

- Placental abruption
- Pre-eclampsia
- Prolonged IUD
- Sepsis
- PPH

Draw blood and put it into a red-top tube (glass tube, no additives)
It should clot within 8 minutes (median 6.5min, range 5-8 min)
If blood takes more than 10 minutes to clot, there is a coagulopathy. This needs urgent management.

Post Caesarean Section Pain Relief
Good analgesia post-operatively is good medicine as well as simply kind.

All women should be prescribed:

- Morphine. Give 2.5-5mg IVI FOUR hourly, regularly, to avoid break through pain. Avoid IMI administration as absorption is poor and abscess risk ↑
- NSAIDS. A suppository inserted in theatre is a good start, followed by regular Ibuprofen 400mg 8hrly or Diclofenac 25mg 8hrly. NSAIDs may need to be omitted in patients with difficult to control blood pressure.
- Paracetamol 1g 6 hourly
- Consider Lactulose to avoid the constipating effect of morphine.
Post-Op Orders for Caesarean Sections

Women who have had a Caesarean section are closely monitored in Maternity Ward post-operatively. This includes:

- Hourly blood pressure and pulse monitoring for 4 hours, then 4 hourly
- Urine output
- Wound status (dry or not)
- PV bleeding

Early mobilisation and feeding are encouraged. Drip and catheter can be removed on Day 1 post-op. The wound should be inspected and the patient discharged if all is well on Day 3. (For post-op patients, use 00h00 as cut-off between Day 0 and Day 1)

Prophylactic enoxaparin 40mg SC daily for two days or until fully mobile should be given to:

- HIV positive women
- BMI > 30
- Pre-eclampsia
- >35 years
- TB
- smoker

Antibiotics are not needed routinely but should be prescribed if there are any of the following risk factors. Use Ampicillin 1g 6-hourly IV and Gentamycin 5mg/kg IV dly and Metronidazole 400mg 8-hrly PO for at least 48 hours or until fever settles.

- Surgery >1hr
- Prolonged ROM
- use of “hand from below” to dis-impact the head
- any known contamination / breach in sterility
- advanced immunosuppression
- cases with unusually prolonged labour
- Chorioamnionitis (single IV dose post partum usually sufficient)

**Note:**
A distinction must be made between post-Caesarean section wound infection and Puerperal sepsis as antibiotic choice differs. See antibiotic table in Pharmacy section.

Early wound infections (in the first 24 to 48 hours) are usually due to group A or B beta-hemolytic Streptococcus and are characterized by high fever and cellulitis. Later infections are more likely to be due to Staphylococcus epidermidis or aureus, Escherichia coli, Proteus mirabilis, or cervicovaginal flora. *[UptoDate]*
**HIV**

**National Guidelines**

The 2019 National ART guidelines are really well presented and worth reading. You can find them by clicking the link. The 2019 PMTCT guidelines are separate.

**PMTCT Protocol for Managing HIV Positive Mothers**

**Antenatal period**

All women should test for HIV on their first antenatal visit. Women who test negative should test again at every full BANC visit, at labour and delivery (and then at 10wk and three-monthly while breastfeeding).

ALL pregnant women who test HIV positive should start ART on the same day – with counselling!

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Regimen choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAART naïve and not in first trimester OR Previous non-current ART with known prev VL LDL</td>
<td>TDF+3TC+DTG (TLD)*</td>
</tr>
<tr>
<td>Previous non-current ART with unknown or no VL or previous VL&gt;1000</td>
<td>Take baseline VL Start AZT+3TC+DTG^ Check VL after 3 months on ART</td>
</tr>
<tr>
<td>Presents in labour with no ART in pregnancy</td>
<td>Give TLD plus NVP stat Start appropriate regimen next day</td>
</tr>
</tbody>
</table>

* Counsel about contraception and NTD risk in women of child-bearing age

^ Insufficient time to restart TFE and check suppression, so choose new NRTI + DTG

Remember the following too:

- Send CD4 count, Creat and ANC blds (and arrange to get result after one week)
- Ensure that there is a plan for proper follow up and that she understands the importance of adherence to regular treatment. The extra time spent on this is well worth it.
- TB screening is essential
  - GeneXpert, regardless of symptoms, for all pregnant women with new HIV diagnosis and all HIV positive women with new pregnancy
  - Only defer ART if woman is ill, with danger signs
  - Once active TB disease excluded, TPT is only given if CD4<100. Otherwise TPT deferred to the postpartum period.
- If CD4 <100 and reflex CrAg positive, do LP in pregnant women
- Ensure monitoring bloods are done on time, esp Creat at 3 and 6 months.

**Mother in labour**

If a patient who has not received antenatal ART presents in labour she should receive NVP 200mg PLUS TLD (TFE+3TC+DTG) 1 tab stat. She should initiate life-long TLD the following day, with appropriate counselling and blood tests.
VL Monitoring in Pregnancy
When completing the lab form for VL testing in pregnancy use the code C#PMTCT to avoid EGK rules resulting in specimen rejection.

Determine when the next VL is due based on these scenarios and the Viral Load Non-Suppression Algorithm which follows.

- **New HIV diagnosis HIV & initiated on ART for the first time:**
  - Do 1st VL at 3m on ART
    - If suppressed, repeat VL at delivery

- **Known HIV-positive women already on ART:**
  - VL at first/booking visit in ANC
    - If suppressed: Repeat VL at delivery.

- **Known HIV-positive women, currently not on ART, but are ART exposed (e.g. previous PMTCT, or ART discontinued) and going to re-start EFV based regimen because DTG not yet available**
  - Do VL before re-starting ART (but don’t await results before starting ART)
    - Repeat VL in one month
      - If more than one log drop in VL - continue & repeat VL in 2m
      - If suppressed, repeat VL at delivery

- **Known HIV-positive women, currently not on ART, but are ART exposed (e.g. previous PMTCT, or ART discontinued) should re-start with TLD if VL known to be previously suppressed, or AZT/3TC/DTG if VL unsuppressed or unknown**
  - Do 1st VL at 3m on ART
    - If suppressed, repeat VL at delivery

- **VL at delivery, to determine**
  - response to ART in ANC
  - prophylaxis for the HIV exposed infant (HEI)
  - re-calibrating time points for maternal VLs during BF

- **VL at 6 weeks after delivery** IF VL >1000 at delivery
- **VL at 6m after delivery**, regardless of BF status
- **VL 6-monthly during BF**, aligned to the 6m, 12m and 18m well child visits
Non-Suppressed Viral Load (VL ≥ 50 c/ml)
Do a thorough assessment of the cause of an elevated VL

VL 50 - 999 c/ml

VL ≥ 1000 c/ml

Start, re-start, or extend infant high-risk prophylaxis. Repeat VL in 4-6 weeks.

VL dropped by > 1 log

VL ≥ 1000 c/ml

Determine if the client should switch to 2nd line, taking into account her current regimen and how long she has been on ART. Refer to the 2019 Consolidated ART Guideline for further management.

Repeat VL in 8-10 weeks*

VL 50 - 999 c/ml

Repeat as per VL Monitoring schedule on page 20

VL < 50 c/ml

* The shorter 4-week interval between the first VL above 1000 and the repeat VL is preferred wherever possible. However, if the first elevated VL is the delivery-VL, the next visit may only occur at the 6-weeks post-natal visit. A HBsAg and HB can also be done at the same time to inform the switch to 2nd line if this becomes necessary.

* The shorter 8-week interval between the first VL of 50 - 999 c/ml and the repeat VL is preferred wherever possible. However, if the first elevated VL is the delivery-VL, and the mother opts to remain in the maternal and child stream for follow-up ART care, the closest coinciding visit will occur at the 10-week EPI visit.

* Women on an EFV-containing regimen who have a second VL result of between 50 and 999 c/ml may be considered for a switch to a DTG-containing regimen, provided she has been thoroughly assessed for her elevated VL, and has been appropriately counseled as outlined on page 17.

Breastfeeding with an Elevated VL

It is recommended that women with a VL ≥ 1000 c/ml on 1st line ART continue to breastfeed. Infant prophylaxis should be extended / restarted while a concerted effort is made to re-suppress the mother’s VL (see Management of a High Maternal Viral Load after Delivery on page 24). Breastfeeding in women who are failing 2nd and 3rd line ART is not recommended. These women should be referred or discussed with a team of experts as outlined in the orange box to the right. See also Stopping Breastfeeding and Indications for Formula Feeding on page 30.
**HIV-exposed Babies: Post Natal Prophylaxis & Follow-Up**

Ensuring that baby gets the correct drug at the correct dose, for the correct duration is essential

<table>
<thead>
<tr>
<th>Infant Risk</th>
<th>Prophylaxis for infant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low risk</strong></td>
<td></td>
</tr>
<tr>
<td>Mother’s VL at (or within 12 weeks of) delivery &lt; 1000</td>
<td>NVP for six weeks only</td>
</tr>
<tr>
<td><strong>High risk</strong></td>
<td></td>
</tr>
<tr>
<td>Mother’s latest VL ≥ 1000</td>
<td>AZT for six weeks, AND NVP for six weeks if formula fed, OR NVP for minimum 12 weeks if breastfed, or until maternal VL &lt; 1000, or until four weeks after breastfeeding stops</td>
</tr>
</tbody>
</table>

### NVP dosing

<table>
<thead>
<tr>
<th>Age</th>
<th>Weight (grams)</th>
<th>NVP Dose DAILY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth to 2 weeks</td>
<td>&lt; 2kg</td>
<td>2mg/kg</td>
</tr>
<tr>
<td>2 weeks to 6 weeks</td>
<td></td>
<td>4mg/kg</td>
</tr>
<tr>
<td>Birth to 6 weeks</td>
<td>2.0 – 2.49kg</td>
<td>10mg (1ml)</td>
</tr>
<tr>
<td>Birth to 6 weeks</td>
<td>&gt; 2.5kg</td>
<td>15mg (1,5ml)</td>
</tr>
<tr>
<td>&gt; 6 weeks to 6 months</td>
<td>&gt; 2kg</td>
<td>20mg (2ml)</td>
</tr>
<tr>
<td></td>
<td>&lt; 2kg</td>
<td>4mg/kg</td>
</tr>
</tbody>
</table>

### AZT dosing

<table>
<thead>
<tr>
<th>Gestational age (Birth – 6 weeks)</th>
<th>Weight</th>
<th>AZT Dose TWICE DAILY</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;35 weeks</td>
<td>&lt; 2kg</td>
<td>4mg/kg/dose</td>
</tr>
<tr>
<td></td>
<td>2.0 – 2.49kg</td>
<td>1.0 ml (i.e. 10mg)</td>
</tr>
<tr>
<td></td>
<td>≥ 2.5kg</td>
<td>1.5 ml (i.e. 15mg)</td>
</tr>
<tr>
<td>30-35 weeks</td>
<td>&lt; 2kg</td>
<td>2mg/kg/dose for 2 weeks, then 4mg/kg/dose</td>
</tr>
<tr>
<td>&lt;30 weeks</td>
<td></td>
<td>2mg/kg</td>
</tr>
</tbody>
</table>

Once older than 6 weeks post birth, refer to ART Dosing Chart for Children

### Infant Testing

ALL infants
- PCR at birth
- PCR at 10 weeks
- PCR or rapid test 6 wks after stopping B/F
- Rapid test at 18 months
Unknown mother – infant new to care
- Rapid HIV test immediately:
- If Rapid test +ve, do PCR:
  - If PCR +ve: ART
  - If PCR -ve: rpt @ 10wks

**PCR and Co-trimoxazole prophylaxis**
- All HIV-exposed babies should have a birth PCR done before leaving hospital
- PCR should be repeated at 10 weeks, as well as 6 weeks after breastfeeding cessation (see table above and reminders in Paediatric HIV section). Do be aware of false negatives – repeat if you are suspicious
- **All HIV exposed newborns to start co-trimoxazole at 6 weeks**
  - Stop once PCR negative > 6 wks after full cessation of breastfeeding and infant is clinically HIV negative
  - If exclusively formula feeding, can stop after a negative PCR if the child is clinically HIV negative.
(See further details on CTX prophylaxis for older children in Paeds HIV section)
Breast Feeding in the Context Of PMTCT

Summary
As a baby friendly hospital, we strongly promote breastfeeding. This is evidence-based practice and applies to both HIV-negative and HIV-infected mothers in the developing world.

Counselling
Mothers should be informed of the feeding choices, what the risks of vertical transmission are, the benefits of breastfeeding and the benefits and disadvantages of formula feeding.

Advice for HIV positive mothers
• Keeping VL suppressed is extremely important. VL should be done 6-monthly during breastfeeding.
• If VL is known to be high, consider donor milk (for admitted preterm neonates) pasteurizing milk, or formula feeding. (If re-lactation is planned, continue to express while waiting for VL to come down)
• Advise formula feeding if resistance to second-line ART is suspected
• Advise mother to seek early treatment for any of these conditions which increase transmission risk:
  o Mastitis and cracked nipples
  o Oral thrush in the infant

In any woman planning to formula feed, ensure they know how to do so safely.
• Ensure safe (boiled) water supply
• Check knowledge re how to mix formula
• Advise re bottle hygiene

Benefits of breastfeeding

<table>
<thead>
<tr>
<th>• Meets nutritional needs</th>
<th>• Cheap (Free!)</th>
<th>• Better bonding</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Easily digested</td>
<td>• Fewer allergies</td>
<td>• Higher intelligence</td>
</tr>
<tr>
<td></td>
<td>• Fewer infectious diseases</td>
<td>• Reduced breast cancer</td>
</tr>
</tbody>
</table>

Reminders:
• Exclusive breastfeeding means giving only breast milk (or meds prescribed by a doctor or nurse), ideally for six months. No water, solids, porridge, rooibos tea, traditional medication, honey or anything else is required.
• From six months, infants should be introduced to other foods including porridge, vegetables and fruit. Oil or peanut butter can be added to improve the calories. Abrupt weaning is not advised as the higher energy requirements cannot be met in a child just learning to take solids.
• At one year of age, breast milk can be replaced by full cream long life cow’s milk (if the mother is HIV positive and can afford it), but aim for 18 months.
• HIV negative mothers should be encouraged to BF for at least 2 years.

All HIV negative mothers who are breastfeeding should be encouraged to test for HIV every three months.
HIV in Children – Testing & Staging

WHEN TO TEST CHILDREN OR INFANTS FOR HIV

<table>
<thead>
<tr>
<th>Recommended intervals for infant testing</th>
<th>Additional factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEST ALL HIV EXPOSED INFANTS</td>
<td>Family and social history (anytime)</td>
</tr>
<tr>
<td>At Birth (PCR)</td>
<td>• Parental request to test the child</td>
</tr>
<tr>
<td>At 10 weeks (PCR):</td>
<td>• Father or sibling with HIV infection</td>
</tr>
<tr>
<td>At 6 months (PCR)</td>
<td>• Death of mother, father or sibling</td>
</tr>
<tr>
<td>At 18 months (with a rapid):</td>
<td>• When the mother’s HIV status is unknown and her whereabouts are unknown</td>
</tr>
<tr>
<td>TEST Breastfed HIV EXPOSED infants:</td>
<td>All children with (anytime)</td>
</tr>
<tr>
<td>6 weeks post cessation of breastfeeding (age appropriate test)</td>
<td>• Clinical features suggestive of HIV infection</td>
</tr>
<tr>
<td></td>
<td>• Acute severe illness</td>
</tr>
<tr>
<td></td>
<td>• Breastfed infant of a newly diagnosed HIV infected breastfeeding mother</td>
</tr>
<tr>
<td></td>
<td>• IMCI classification of Suspected symptomatic HIV infection</td>
</tr>
<tr>
<td></td>
<td>• IMCI classification of Possible HIV infection</td>
</tr>
<tr>
<td></td>
<td>• TB diagnosis or history of TB treatment</td>
</tr>
<tr>
<td></td>
<td>• Risk of experience of sexual assault</td>
</tr>
<tr>
<td></td>
<td>• Wet-nursed or breastfed by a woman with unknown or HIV positive status</td>
</tr>
</tbody>
</table>

WHO CLINICAL STAGING OF HIV/AIDS FOR INFANTS & CHILDREN

As this Handbook is intended as a practical guide, only Stage 4 conditions are included here: these qualify children to be fast-tracked. (It’s also a reminder of how great ARVs are; these used to be common.) Please look up Stages 1, 2 & 3.

STAGE 4

- Unexplained severe wasting or severe malnutrition not responding to std therapy
- Pneumocystis pneumonia
- Extrapulmonary TB
- Recurrent severe presumed bacterial infections (eg empyema, pyomyositis, bone or joint infection, meningitis, but excluding pneumonia)
- Chronic herpes simplex infection (orolabial or cutaneous of more than one month’s duration)
- Kaposi’s sarcoma
- Oesophageal candidiasis
- CNS toxoplasmosis (outside the neonatal period)
- HIV-associated encephalopathy, cardiomyopathy or nephropathy
- CMV infection (CMV retinitis or infection of organs other than liver, spleen or lymph nodes; onset at the age of one month or more)
- Extrapulmonary cryptococcosis including meningitis
- Any disseminated endemic mycosis (eg extrapulmonary histoplasmosis)
- Cryptosporidiosis or Isosporiasis
Co-trimoxazole (Bactrim) prophylaxis in children

- All HIV exposed newborns to start at 6 weeks
  - Stop once PCR negative > 6 wks after full cessation of breastfeeding and infant is clinically HIV negative
  - If exclusively formula feeding, can stop after a negative PCR if the child is clinically HIV negative.
- All HIV infected children < 12 months regardless of ART status

- HIV infected children 1-5 years
  - Start all symptomatic children, Stage 2,3,4, or CD4 < 25%
  - Stop once on ART and CD4 >25% (preferably with virological suppression)
- HIV infected children older than 5 years old
  - Start once CD4 <200 or WHO stage 2, 3 or 4
  - Stop once CD4 >200 on ART. Only one result needed
- HIV infected child with high risk of bacterial infections
  - Start even with ART immune reconstitution
  - Stop once CD4 up or risk eliminated
- HIV infected child with previous PCP
  - Continue until 5 years old and only stop then if CD4>200

### Dosing table (prophylaxis for children)

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>3-4.9</th>
<th>5-9.9</th>
<th>10-13.9</th>
<th>14-29.9</th>
<th>≥ 30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cotrimoxazole dose</td>
<td>2.5ml od</td>
<td>5ml od</td>
<td>5ml od</td>
<td>10ml or 1 tab od</td>
<td>2 tabs od</td>
</tr>
<tr>
<td>Multivitamin dose</td>
<td>2.5ml od</td>
<td>2.5ml od</td>
<td>5ml od</td>
<td>5ml od</td>
<td>10ml or 1 tab od</td>
</tr>
</tbody>
</table>

Starting Children on ARVs

**START CRITERIA**

All children qualify for HAART, regardless of their CD4 count or clinical stage.

Please note the following criteria for fast-tracking (i.e. start ART within 7 days of being eligible)

- Children less than 1 year of age
- CD4 count < 200 cells/μl or < 15 %
- WHO clinical Stage 4
- MDR or XDR-TB

Social criteria are extremely important for the success of treatment and need to be adhered to – the principle is that adherence to treatment must at least be probable.

- At least one identifiable caregiver who is able to supervise the child for administering medication (all efforts should be made to ensure that the social
circumstances of vulnerable children, e.g. orphans, are addressed so that
they too can receive treatment).
- Disclosure to another adult living in the same house is encouraged so that
there is someone else who can assist with the child’s ART.
- Treatment of mother/caregiver/other family member is to be encouraged.

BASELINE INVESTIGATIONS
Note: the new guidelines use a 2nd DNA PCR test as a confirmatory for positive
DNA PCR test. A viral load is no longer indicated as either a confirmatory test or
as a baseline investigation before starting ART.

At diagnosis, ensure the following:
- Weight, height, head circumference (under 2yr) and development
documented
- TB screening
- WHO staging
- CD4 count (note: do not delay start while waiting for this)
- FBC
- Creatinine – if you are going to start TDF
- Chol & Trig – if going to start a PI
- ALT if on TB treatment

REGIMENS

<table>
<thead>
<tr>
<th>1st line</th>
<th>Birth to &lt;4wks of age (consult expert &lt;2.5kg)</th>
<th>AZT + 3TC + NVP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Children ≥4wks of age and ≥42wks GA</td>
<td>ABC + 3TC + LPV/r</td>
</tr>
<tr>
<td></td>
<td>Children &gt;20kg OR &lt;10yrs old</td>
<td>ABC + 3TC + DTG</td>
</tr>
<tr>
<td></td>
<td>Children &gt;35kg AND ≥10yrs old</td>
<td>TDF + 3TC + DTG</td>
</tr>
<tr>
<td></td>
<td>(and normal renal fx: CrCl &gt;80ml/min)</td>
<td>(FDC=TLD)</td>
</tr>
<tr>
<td></td>
<td>Children &gt;3yrs AND &gt;10kg if no DTG</td>
<td>ABC + 3TC + EFV</td>
</tr>
</tbody>
</table>

| 2nd line | If you think a child may need to change to second line treatment you MUST discuss this with a doctor experienced in providing ART to children |

Note:
- Always dose children according to weight or body surface area (see charts in ARV clinic & OPD)
- **If a child needs simultaneous TB Rx and ART, please discuss with an experienced doctor.** (A number of children have resistance due to inadequate boosting of LPV/r. Double dosing Kaletra (LPV/r) in younger children is not acceptable, so other strategies are needed depending on what drugs you have available.)
Switching First Line Regimens in Children

The SA NDOH has changed first-line HAART and we need to switch all children who don’t have contraindications, in an orderly manner over the next 12-18 months, using this algorithm.

### Switching Children and Adolescents who are on First-Line Paediatric Regimens

Children and adolescents currently on the following first-line regimens and weighing ≥ 20 kg:
- ABC + 3TC + LPV/r
- ABC + 3TC + EFV

#### Routine VL Monitoring:
(First VL at 6 months on ART. If virally suppressed (< 50 c/mL), repeat VL at 12 months on ART, and 12-monthly thereafter if viral load remains suppressed)

- Check if client has a VL result in the last 6 months*

#### VL < 50 c/mL
- Provide information on the risks and benefits of DTG, and the implications for childbearing in later years (see “Dolutegravir” on page 8). Enable the caregiver/adolescent to make an informed decision

#### VL 50 - 999 c/mL
- Do a thorough assessment of the cause of an elevated VL as outlined on page 16
- Implement interventions and provide enhanced adherence support
- Repeat VL in 3 months

#### VL ≥ 1000 c/mL
- Ensure that the elevated VL is correctly managed according to the VL results management algorithm on page 16
- Do not switch to DTG at this time

#### Caregiver/adolescent chooses to switch to DTG

- Weight ≥ 20 kg and < 35 kg, or < 10 years of age
- ABC + 3TC + DTG

- Weight ≥ 35 kg and age ≥ 10 years, and renal function normal
- If weight reaches 35 kg or more, and VL < 50 c/mL in the last 6 months, and renal function is normal
- TDF + 3TC + DTG

*If a client has not had a VL test in the last 6 months, additional VL testing outside of the routine VL monitoring schedule should NOT be done. The client should await the result of their routine annual VL test to determine their eligibility to switch to DTG.

---

*Switching LPV/r to DTG in this regimen applies strictly to first-line regimens only. If ABC + 3TC + LPV/r is used as a second-line regimen, it is possible that both NRTIs in the regimen are inactive. DTG should not be used without at least 1 active NRTI. If DTG is to be considered within a second-line regimen, expert guidance should be sought to ensure that at least 1 NRTI is active.
### Antiretroviral Drug Dosing Chart for Children (2021)

Compiled by the Child & Adolescent Committee of the SA HIV Clinicians Society in collaboration with the Department of Health. Adapted fractionally for ease of dispensing.

<table>
<thead>
<tr>
<th>Target dose</th>
<th>Abacavir (ABC)</th>
<th>Lamivudine (3TC)</th>
<th>Zidovudine (AZT)</th>
<th>Lopinavir/ Ritonavir (LPV/r)</th>
<th>Ritonavir boosting (RTV)</th>
<th>Atazanavir (ATV) + Ritonavir (RTV)</th>
<th>Dolastegavir (DTG)</th>
<th>Stavudine (d4T)</th>
<th>Efavirenz (EFV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-3.9</td>
<td>2ml bd</td>
<td>2ml bd</td>
<td>6ml</td>
<td>1ml bd</td>
<td>1.5ml bd</td>
<td>Avoid ATV capsules when &lt;15kg or &lt;6 years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-4.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-5.9</td>
<td>3ml bd</td>
<td>3ml bd</td>
<td>9ml</td>
<td></td>
<td>*1.5ml bd</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-6.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-7.9</td>
<td>4ml bd</td>
<td>4ml bd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-8.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9-9.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-10.9</td>
<td>Choose ONE option</td>
<td>Choose ONE option</td>
<td>2ml bd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11-11.9</td>
<td>6ml bd or 12ml od or 12ml od</td>
<td>6ml bd or 12ml od</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14-16.9</td>
<td>8ml bd or 15ml od</td>
<td>15ml od</td>
<td>2 caps am; 1 cap pm</td>
<td>2.5ml bd OR 200mg caps bd</td>
<td>1x 500mg tab od</td>
<td>Give TWICE daily if on Rifampicin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17-19.9</td>
<td>2x60mg tabs bd</td>
<td>15ml od</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-22.9</td>
<td>10ml bd OR 3x60mg tabs bd</td>
<td>30ml od</td>
<td>2 caps</td>
<td>3ml bd OR 2x paed tabs bd</td>
<td>2.5m bd OR 200mg caps bd</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23-24.9</td>
<td>1x 300mg + 2x60mg tabs od</td>
<td>15ml od</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25-29.9</td>
<td>1x300mg tab bd</td>
<td>1x150mg tab bd</td>
<td>1 tab</td>
<td>3.5ml bd OR 3x paed tabs bd</td>
<td>3ml bd / 300mg bd</td>
<td>1x 500mg tab od OR FDC: TLD@</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-34.9</td>
<td>30mg bd</td>
<td>2x200mg</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35-39.9</td>
<td>600mg tab</td>
<td>&gt;40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Available formulations**

- Sol. 20mg/ml Tabs 60mg (scored, dispense)
- Sol. 10mg/ml Tabs 150mg (scored)
- Sol. 10mg/ml Tabs: 100mg & 300mg (not scored)
- Sol. 80/20mg/ml Adult Tabs 200/50mg
- Sol. 80/20mg/ml Paed Tabs 100/25mg
- Sprinkles / pellets on separate table
- FDC: ABC/3TC 600/300mg
- FDC: ABC/3TC 600/300mg
- ATV 1x 200mg cap od + RTV 1x 100mg cap od
- Note: 200mg cap is not available in many places. Consult expert for alternative

**Target dose**

- By wt. band ONCE daily
- By wt. band ONCE daily
- Avoid using when <10kg or <3yrs as dosing not established
- Give extra 50mg DTG 12hr after TLD dose if on Rifampicin
- By wt. band ONCE daily
LOPINAVIR / RITONAVIR SPRINKLES (PELLETS)

Lopinavir/Ritonavir is now available in pellet format, for small children who spit the solution (Kaletra), which tastes awful. The pellets are known as Lopimune.

Dosing table.

<table>
<thead>
<tr>
<th>Child weight (kg)</th>
<th>Dosing, to be taken TWICE a day</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-5.9</td>
<td>80/20mg (2 capsules)</td>
</tr>
<tr>
<td>6-9.9</td>
<td>120/30 (3 capsules)</td>
</tr>
<tr>
<td>10-13.9</td>
<td>160/40 (4 capsules)</td>
</tr>
<tr>
<td>14-19.9</td>
<td>200/50 (5 capsules)</td>
</tr>
<tr>
<td>20-24.9</td>
<td>240/60 (6 capsules)</td>
</tr>
</tbody>
</table>

This video explains how to use the pellets: [https://tinyurl.com/y3vjjpfw](https://tinyurl.com/y3vjjpfw)

If you want to see the full colour version of the Paeds ART dosing table, click [here](https://tinyurl.com/y3vjjpfw).

IMPORTANT QUESTIONS FOR EVERY PAEDS HIV CONSULT

- Ask about TB symptoms
- Is there a TB contact?
- Where are we at with disclosure TO THE CHILD?
- Is the child spitting Kaletra? (Have you tried Peanut butter?)
- How is school? Did you pass?
- Teens: Uyathaka? Sexual practices. Understanding re sex and HIV.
Virological Failure in Children

Please see section on Virological Failure in Adults as well.

**Viral load <50 copies/ml**
- 12 monthly viral load monitoring and routine adherence support
- Children under 5 years and teenagers need six-monthly VL monitoring

**Viral load 50-999 copies/ml**
- Intensify adherence.
- Repeat VL in THREE months

**Viral load >1000 copies/ml**
- Reinforce adherence (very difficult to fail a PI-based regimen unless the child received unboosted PI or was on rifampicin containing TB treatment while on a PI) or terrible adherence >2yrs
- **Repeat VL in THREE months** (and do CD4 count)
- If < 50, return to routine Viral load monitoring as above
- If VL 50-999, continue step up adherence & repeat VL after 3 months again
- If child on a NNRTI-based regimen AND > 1000 on two consecutive occasions, despite stepped up adherence support, discuss with expert regarding new regimen.
- If on PI-based regimen AND > 1000 on at least three occasions over two years, discuss with an expert regarding new regimen.
- If the child received an unboosted PI (e.g. ritonavir alone) in the past or received TB treatment while on a LPV/r regimen and the VL is > 1000 copies/mL, discuss with an expert regarding new regimen. Resistance testing is indicated in these situations but should only be done if the child has been reliably taking their ARVs in the past month.

**Second line ART options in children**
In children with confirmed Virological Failure, change regimens as follows, after discussing with a doctor experienced in Paeds HIV (NB!)

<table>
<thead>
<tr>
<th>Regimen</th>
<th>NNRTI-based regimen</th>
<th>PI-based regimen for &gt;2yrs</th>
<th>InSTI-based regimen for &gt;2yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resistance testing</td>
<td>Resistance test not required</td>
<td>Resistance test required</td>
<td>Resistance test required</td>
</tr>
<tr>
<td>Resistance test result</td>
<td>Not applicable</td>
<td>No PI resistance</td>
<td>PI resistance</td>
</tr>
<tr>
<td>Weight</td>
<td>&lt;20kg</td>
<td>≥20kg</td>
<td>≥20kg</td>
</tr>
<tr>
<td>New Regimen</td>
<td>ABC/AZT/TDF + XTC + EFV/NVP</td>
<td>ABC/AZT/TDF + XTC + PI</td>
<td>ABC/AZT/TDF + XTC + DTG</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>New Regimen</th>
<th>2 NRTIs + DTG</th>
<th>Cont current regimen – address adherence</th>
<th>2 NRTIs + DTG</th>
</tr>
</thead>
<tbody>
<tr>
<td>If NRTI activity uncertain</td>
<td>2 NRTIs + PI/r</td>
<td>If NRTI activity uncertain</td>
<td>Refer to TLART committee</td>
</tr>
</tbody>
</table>

All people on DTG will be ≥20kg

<table>
<thead>
<tr>
<th>New Regimen</th>
<th>2 NRTIs + DTG</th>
<th>If NRTI activity uncertain, refer TLART</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refer to TLART committee</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Second line ART options in children**

In children with confirmed Virological Failure, change regimens as follows, after discussing with a doctor experienced in Paeds HIV (NB!)

<table>
<thead>
<tr>
<th>Regimen</th>
<th>NNRTI-based regimen</th>
<th>PI-based regimen for &gt;2yrs</th>
<th>InSTI-based regimen for &gt;2yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resistance testing</td>
<td>Resistance test not required</td>
<td>Resistance test required</td>
<td>Resistance test required</td>
</tr>
<tr>
<td>Resistance test result</td>
<td>Not applicable</td>
<td>No PI resistance</td>
<td>PI resistance</td>
</tr>
<tr>
<td>Weight</td>
<td>&lt;20kg</td>
<td>≥20kg</td>
<td>≥20kg</td>
</tr>
<tr>
<td>New Regimen</td>
<td>ABC/AZT + 3TC + LPV/r</td>
<td>2 NRTIs + DTG</td>
<td></td>
</tr>
<tr>
<td>If NRTI activity uncertain</td>
<td>2 NRTIs + PI/r</td>
<td>Refer to TLART committee</td>
<td></td>
</tr>
</tbody>
</table>

All people on DTG will be ≥20kg

<table>
<thead>
<tr>
<th>New Regimen</th>
<th>2 NRTIs + DTG</th>
<th>If NRTI activity uncertain, refer TLART</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refer to TLART committee</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Important Extras About Paeds HIV At Zithulele

- Keep (especially younger) kids at Zithulele where possible. It is important not to make mistakes with their treatment.
- Try treat families together
- Breastfeeding takes thought. Guidelines say stop at one year. Need to assess social realities as to what is the best for each child
- Please ensure the following get documented:
  - PMTCT exposure (maternal ART, baby’s meds, duration)
  - Date of TB treatment and basis of diagnosis
- Remember that every patient is an opportunity to test and find contacts. Children are “canaries” for HIV and TB
- Make sure you know something about the “Earnest Trial”

3TC Monotherapy
A child failing first or second line treatment with a CD4 count >20% and thriving should be put onto 3TC (lamivudine) monotherapy – once daily dosing.
- CD4 count must be monitored every three months, unless two successive results > 30%, in which case can do six-monthly.
- Please do NOT repeat the viral load while on 3TC monotherapy.
- Monitor growth, head circumference (if under 2y) and neurodevelopment at each visit
- If poor adherence was due to spitting Kaletra, teach child to swallow tablets where possible
- When CD4 < 20%, or failure to thrive, neurodevelopmental issues, recurrently unwell, need to consider restarting appropriate regimen.

Disclosure
Needs to begin today (if not sooner!)
- Be age appropriate (e.g. a dragon sleeping in your blood)
- Even if child too young, we need to be having the chat with carer every visit.
- Don’t allow family to pass the buck
- Other “positively deviant” moms are wonderful mentors
- Talk about a treatment coach. Like in Soccer.
**Opportunistic Infections in HIV Positive Children**

**PCP**

**Suspect if:**
- < 1 year
- Cyanosed
- Severe tachypnoea (>50 in an infant, >40 in a child)
- Few crackles on auscultation relative to respiratory rate
- CXR – diffuse bilateral interstitial infiltrates.

**Management:**
1. **Oxygen**
2. **Co-trimoxazole PO/IV:** 20mg/kg/DAY, in divided doses QDS for 3wks
   - NB: *dose according to Trimethoprim component*
   - If using IV preparation, ensure adequate dilution
3. **Prednisone** 1-2 mg/kg/day for 2 weeks
   - If prescribing syrup (3mg/ml) please do so in multiples of 3mg.
   - If prescribing tablets (5mg) please do so in multiples of 5mg.
4. **Treat for community acquired pneumonia**
   - NB! NB! Don’t forget the prednisone!!

**Cryptococcal Meningitis - See protocol in adult HIV section**

**Chronic Diarrhoea (>2 weeks)**
1. Change to soya milk based feed
2. Give Zinc for 10-14 days. (Under 10kg: 5ml daily; Over 10kg: 10ml daily)
3. Cholestyramine 1g QDS PO for 5 days
4. Metronidazole 7.5mg/kg PO TDS for 5 days

If not responding, consider:
- Treating with kanamycin PO. (Speak to the pharmacy re dose)
- Infection elsewhere, e.g. UTI
- Stool microscopy for atypical organisms
- Small, frequent meals

**Lymphocytic interstitial pneumonia**

**Clinical Features**
- Bilateral reticulonodular infiltrates and mediastinal adenopathy on CXR
- Parotid gland enlargement
- Clubbing
- Recurrent bacterial LRTIs, chronic lung disease, bronchiectasis
- Progressive hypoxia and exertional fatigue

**Management**

Treat if hypoxic (SpO2 <92%) or signs of cor pulmonale
- 2mg/kg prednisone for 4 weeks then wean to lowest dose to maintain
  sats >92%

**NB: Exclude bacterial and TB pneumonia first**
A New Adult HIV Diagnosis: What To Do

1. Ensure that any newly diagnosed patient has received adequate post-test counselling.
2. All HIV infected adults and children qualify for HAART. Start counselling for treatment. Do a CD4 count and bring back to hospital or clinic for result in 1 week.
3. Decide whether patient is eligible for fast-track start based on CD4 result (<200 cells/mm³) and clinical staging (Stage 4).
4. Don’t forget Bactrim 2 tabs/day & VitBCo 1 tab/day whilst awaiting CD4 result (discontinue if CD4 > 350).

A main emphasis of the HIV/ARV programme is decentralized care. The goal is that the vast majority of patients test, prepare for HAART, initiate HAART and get followed up at their local clinic. Where possible, a doctor should visit each clinic for clinical support. A designated person should be responsible for default tracing.

At all times every effort should be made to integrate care for TB and chronic diseases into the management and follow up of HIV/HAART.

The government’s pre-packing programme, called CCMDD, helps ensure patients get HIV and other Chronic meds on time. Find out if it applies in your area.

Co-Trimoxazole (Bactrim) Prophylaxis in Adults

Bactrim prophylaxis is extremely important! Please remember it (2 tab ie 960 mg daily) – it markedly reduces mortality and hospitalisation by providing protection against:

- Pneumocystis jirovecii Pneumonia (aka PCP)
- Toxoplasmosis
- Diarrhoea caused by Cystoisospora belli
- Numerous bacterial infections

When to give (2 tablets daily):

- Start at CD4 < 200 or Stage 2, 3, 4 disease
- Good efficacy early, little shown after 72 weeks
- Stop once CD4 > 200. Only one result is needed.

Remember prolonged higher dosing (2 tab BD for 2 years) for prophylaxis after treatment for Cystoisospora belli.

If allergic to Bactrim, use Dapsone 100 mg daily, though protection not as good.
**Starting Adults on HAART**

**Start Criteria**
South Africa has adopted the WHO’s Universal Test and Treat (UTT) strategy. Everyone qualifies, although patients with CD4<350 should be prioritised. Remember that some groups need to be fast tracked, others delayed.

<table>
<thead>
<tr>
<th>Immediate</th>
<th>Fast track start (&lt;14 days)</th>
<th>Delayed start</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnant women</td>
<td>CD4 &lt; 200</td>
<td>Drug sensitive TB – see details in TB Section</td>
</tr>
<tr>
<td></td>
<td>Stage 4 disease</td>
<td>Cryptococcal disease or TBM: wait for 4-6 weeks treatment</td>
</tr>
<tr>
<td></td>
<td>Drug resistant TB</td>
<td></td>
</tr>
</tbody>
</table>

**Regimens**

<table>
<thead>
<tr>
<th>1st Line</th>
<th>All new patients needing treatment, including pregnant women**</th>
</tr>
</thead>
<tbody>
<tr>
<td>TDF + 3TC + DTG FDC “TLD” preferred</td>
<td>New first line fixed dose with DTG. Must be &gt;35kg</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>On TB treatment not yet on ART</th>
<th>Pregnant women or women who prefer not to use DTG**</th>
</tr>
</thead>
<tbody>
<tr>
<td>TDF + 3TC + EFV (FDC “TFE” aka “TEE” preferred)</td>
<td>To avoid unnecessary drug interactions, start TB pts not yet on ART on EFV based regimen.</td>
</tr>
</tbody>
</table>

**Possible NTD risk – avoid starting in first trimester or if woman prefers EFV**

**Contraindications to DTG and EFV**: Use NVP based regimen: In patients with significant psychiatric co morbidity or intolerance to EFV and where the neuro-psychiatric toxicity of EFV may impair daily functioning, e.g. shift workers

**Contraindication to TDF**: Use ABC or AZT in renal disease or the use of other nephrotoxic drugs e.g. aminoglycosides.

Guidance on switching regimens for people already on ART is later in this section.
Baseline & Monitoring Blood Tests For ARV Patients

Baseline blood tests are: CD4 count, Creatinine, FBC

In women, do a PAP smear if none in past year
In pregnant women, add RPR, Rhesus
In children, ensure a second PCR has been done for confirmation (No longer VL)
In patients starting a NVP based regimen, add ALT
In patients not starting TDF, add HepBSAg

Regular monitoring is as follows:

<table>
<thead>
<tr>
<th>Test</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD4</td>
<td>at 1 year on ART, then 6 monthly thereafter until not needing Bactrim</td>
</tr>
<tr>
<td>VL</td>
<td>at month 6, 1 year on ART and then every 12 months (Remember that children &lt; 6 yrs and teenagers continue to get VL every 6 mo)</td>
</tr>
<tr>
<td>Creatinine</td>
<td>at month 3 and 6, 1 year then every 12 months if on TDF</td>
</tr>
<tr>
<td>Urine dipstix</td>
<td>as for Creat, to look for proteinuria – follow up if present!</td>
</tr>
<tr>
<td>ALT</td>
<td>only if on NVP and develops rash or symptoms of hepatitis</td>
</tr>
<tr>
<td>FBC</td>
<td>at month 3 and 6, then every 12 months, if on AZT</td>
</tr>
<tr>
<td>Fasting cholesterol and triglycerides</td>
<td>only at month 3 if on LPV/r</td>
</tr>
</tbody>
</table>

ARV Start Visit – Important Pointers

- Check the patient has a treatment partner (TP) and baseline bloods
- Check patient has disclosed to household
- Check knowledge. MUST know the following:
  1. How does someone get HIV? (sex, blood, vertical)
  2. What does HIV do to the body? (decreases CD4, body’s army, so no protection against infections)
  3. How does one take ARVs? (same time, once or twice a day depending on regime, rest of your life)
  4. Names of ARVs & identify tablets in your regimen
  5. What happens if you take tabs incorrectly? (they stop working, you get sick)
  6. Some side effects & what you do if you get them (don’t stop, see dr/sr)

- Check patient has cell phone/alarm clock as a reminder to take tabs
- Ask if any problems (act on any headache, OIs, blood abnormalities, etc)
- Specifically ask about TB symptoms & TB meds
- If they are on TB or chronic meds, arrange to give them all at ARV follow-up so they don’t have to attend OPD as well
- Please write longer clinical notes in the OPD (hand-held) record.
- Record clearly that the patient is “starting HAART today”
- Issue and complete green follow up summary card.
- Prescribe ARVs in file.
- Prescribe any other meds in OPD book (don’t forget TB meds & prophylaxis)
- Fill in patient held green card & explain where the return date is.
Making ARV Care Better and Safer

Patients starting ART (or restarting after default, or starting second line after failure, especially if prolonged) may be at risk of IRIS, especially if they have a low CD4 count.

Please think through whether the following approaches to care are appropriate to implement for your patient.

If the CD4 is less than 100
- The following contribute to improved mortality (*resources might currently restrict us from applying this universally, but if your ART start / re-start patient is very unwell and especially if their CD4 count is extremely low, consider the following evidence based interventions)
  - Bactrim
  - 12 weeks Fluconazole*
  - 5 days of Azithromycin*
  - 1 dose of Mebendazole
  - Urine LAM (sensitivity ~50%)
  - TB Preventative therapy (currently IPT).
  - Remember to delay HAART after TBM, CCM or PTB if CD4>50

Cover people on TB treatment with steroids
When starting ARVs for someone on TB treatment, steroids reduce the risk of IRIS for people with CD4 count <100
- Exclude KS
- 40mg daily for two weeks
- then 20mg daily for two weeks

Be active about diagnosing TB in anyone with HIV who is admitted
See TB section above
In addition, do Urine LAM on:
  - all admitted HIV positive patients
  - all HIV positive people with Hb <8g/dl

HIV Hotline
The HIV Hotline for Healthcare workers offers generally excellent advice.

Contact them by:
Phoning 0800-212506 or 021-4066782
Sending a “please call me” to 071-84015721
A free app from the Hotline is also available for Android phone users

For Paediatric and Adolescent ART questions, phone the Right to Care Helpline: 082-3526642
Switching First Line Regimens in Adults

The SA NDOH has changed first-line HAART and we need to switch all adults who don’t have contraindications, in an orderly manner over the next 12-18 months, using this algorithm

**Switching Adults, and Adolescents who are on First-line Adult Regimens**

**Routine VL Monitoring:**
(First VL at 6 months on ART. If virally suppressed (< 50 c/mL), repeat VL at 12 months on ART, and 12-monthly thereafter if viral load remains suppressed)

Check if client has a VL result in the last 6 months*

- **VL < 50 c/mL**
  - Provide information on the risks and benefits of DTG, and the use of contraception in WOCP (see page 8). Enable the client to make an informed decision.

- **VL 50 - 999 c/mL**
  - Do a thorough assessment of the cause of an elevated VL as outlined on page 16. Implement interventions and provide enhanced adherence support.
  - Repeat VL in 3 months

- **VL 50 - 999 c/mL**
  - Ensure that the elevated VL is correctly managed according to the VL results management algorithm on page 16.
  - Do not switch to DTG at this time

- **VL ≥ 1000 c/mL**
  - Client chooses to remain on their current regimen

- **If current regimen is TDF + 3TC/FTC + EFV/NVP**
  - Switch to TDF + 3TC/FTC + DTG

- **If current regimen is AZT/ABC + 3TC + EFV/NVP**
  - Switch to AZT/ABC + 3TC + DTG

Only switch a stable pregnant woman on ART from EFV to DTG if her VL is < 50 copies/mL, and she is no longer in the first 6 weeks of pregnancy. A switch to DTG needs to be preceded by WOCP being given all necessary information on DTG and EFV-based regimens including the risk of NTDs. Discuss postpartum contraceptive options and allow her to make an informed choice.

Warn the client of the new side-effects that may be experienced when switching to DTG (insomnia, headache, GIT disturbances). These are usually mild and self-limiting. If the client experiences insomnia, DTG can be taken in the morning.

*If a client has not had a VL test in the last 6 months, additional VL testing outside of the routine VL monitoring schedule should NOT be done. The client should await the result of their routine annual VL test to determine their eligibility to switch to DTG.

*Clients on CCMDD can be considered for a switch to TLD and remain on CCMDD if they have a VL < 50 c/mL in the last 6 months. For more information see the TLD Transition Guide for Implementers, or the CCMDD SOP: Changing of ARV regimen from TEE to TLD (CCMDD SOP-16).
Adjusting HAART in Renal Failure

Remember:
- eGFR must be calculated BEFORE starting a patient on TDF
- Creatinine must be carefully monitored in patients on TDF
- If renal function deteriorates in a patient on TDF, check HepBSAg before withdrawing it blindly
- Renal disease is relatively common in HIV +ve people. Think about it and adjust ARV doses accordingly (see table below)
- If renal function improves, change the doses back up again to avoid resistance due to sub-therapeutic drug levels

<table>
<thead>
<tr>
<th>Age</th>
<th>Measure</th>
<th>Acceptable level for TDF use</th>
<th>Counahan Barratt formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;10 and &lt;16yrs old</td>
<td>eGFR using Counahan Barratt</td>
<td>eGFR &gt; 80</td>
<td>eGFR (ml/min/1.73m²)</td>
</tr>
<tr>
<td>Adults &gt;16yrs</td>
<td>eGFR using MDRD equation</td>
<td>eGFR &gt; 50</td>
<td></td>
</tr>
<tr>
<td>Pregnant women</td>
<td>Absolute Creat level</td>
<td>&lt;85 µmol/l</td>
<td></td>
</tr>
</tbody>
</table>

DOSE ADJUSTMENTS FOR eGFR under 50ml/min (adults)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Doses depending on CrCl (in ml/min)</th>
<th>“Normal”</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CrCl &lt;10</td>
<td>CrCl 10-50</td>
</tr>
<tr>
<td>Zidovudine (AZT)</td>
<td>300mg dly</td>
<td>unchanged</td>
</tr>
<tr>
<td>Lamivudine (3TC)</td>
<td>50mg dly</td>
<td>150mg dly</td>
</tr>
<tr>
<td>Stavudine (D4T)</td>
<td>15mg daily</td>
<td>15mg dly</td>
</tr>
<tr>
<td>Tenofovir (TDF)</td>
<td>DO NOT USE if creat clearance &lt;50ml/min. If use imperative due to HepB, then doses:</td>
<td>Omit 300mg 2-3x/wk</td>
</tr>
<tr>
<td>Abacavir (ABC)</td>
<td>Unchanged</td>
<td>Adult dose: 300mg BD or 600mg OD</td>
</tr>
<tr>
<td>Protease inhibitors (PIs)</td>
<td>Unchanged</td>
<td>(LPV/r dose in adults: 200/50 2 tabs BD)</td>
</tr>
<tr>
<td>INSTIs</td>
<td>Unchanged</td>
<td>DTG dose 50mg OD in adults</td>
</tr>
<tr>
<td>NNRTIs (EFV &amp; NVP)</td>
<td>Unchanged</td>
<td>EFV dose in adults 600mg OD. NVP 200mg BD</td>
</tr>
</tbody>
</table>

Patients with TDF induced renal failure who don’t respond to stopping the drug or IV fluid should be referred for peritoneal dialysis if they have any of the following:
- Anuria
- Uraemic encephalopathy (seizures or confusion)
- Uraemic bleed
- Uraemic pericardial effusion
- Rising, elevated potassium despite medical management
Virological Failure in Adults

The goal of ART in virological terms is achieving & maintaining an undetectable viral load (VL). This can reasonably be expected after 3–6 months of treatment.

Virological failure is defined as a vial load of >1000 copies/ml on 2 separate, consecutive occasions, usually 2 months apart, despite intensive adherence counselling. PLEASE ALWAYS FOLLOW UP VL RESULTS & ACT TIMEOUSLY ON ANY UN-SUPPRESSED VL.

If you are not sure how to act, ask a senior, or phone the HIV hotline 0800 212506 or 021 4066782 or Right to Care for kids: 0823526642

Causes - ABCDE
- Poor Adherence
- An OI such as TB, or Poor absorption (chronic diarrhoea/vomiting)
- Incorrect regimen (wrong dose – esp in kids, weak combination)
- Drug interactions (TB meds, anti-epileptics, etc)
- Infection with a resistant strain

Adherence counselling is not just about addressing whether the patient is taking the tablets correctly. It includes checking for intolerable side effects/toxicity, potential drug interactions, social support & disclosure, depression, optimizing memory aids (alarm clock, treatment partner). Roughly 50% of failing patients will suppress given appropriate adherence support.

Important issues to consider
- Switching too early risks missing the possibility for re-suppression & limits regimen options in future
- Switching too late risk emergence of resistant mutations, limiting efficacy of 2nd line regimens
- Raised VL may also be lab error or a ‘blip’ (temporary viral break through due to other infections such as viral URTIs)
- Before changing anyone to second line ARVs please discuss with a senior!!

Management of an unsuppressed VL

<table>
<thead>
<tr>
<th>Viral Load</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-999 copies/ml</td>
<td>Intensify adherence.</td>
</tr>
<tr>
<td></td>
<td>Repeat VL at THREE months</td>
</tr>
<tr>
<td>&gt;1000 copies/ml</td>
<td>Intense adherence assessment</td>
</tr>
<tr>
<td></td>
<td>Check Hep B status if unknown</td>
</tr>
<tr>
<td></td>
<td>Repeat VL at THREE months</td>
</tr>
</tbody>
</table>

Action for a VL repeated after THREE MONTHS
- If <50 return to 6 or 12 monthly monitoring
- If 50-999, repeat again in 3 months
- If >1000 & adherence issues addressed, discuss, then switch to Second Line as per table below. Timing of switch & drug choice depends on current regimen and duration of ART
In adults with confirmed Virological Failure, change regimens as follows:

<table>
<thead>
<tr>
<th>Regimen</th>
<th>First line regimens</th>
<th>Second line regimens</th>
</tr>
</thead>
<tbody>
<tr>
<td>NNRTI-based</td>
<td>TDF + XTC + EFV/NVP</td>
<td>TDF + XTC + DTG</td>
</tr>
<tr>
<td>InSTI-based</td>
<td>TDF + XTC + DTG</td>
<td>AZT/TDF + XTC + PI</td>
</tr>
<tr>
<td>PI-based</td>
<td>for &gt;2yrs</td>
<td></td>
</tr>
<tr>
<td>for &gt;2yrs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Resistance testing
- Resistance test **not required**
- Consult expert as to whether test **required**
- Resistance test **required**

Resistance test result
- Not applicable
- Not applicable
- No PI resistance
- PI resistance

HepB status
- HBV neg
- HBV pos

New Regimen

<table>
<thead>
<tr>
<th>New Regimen</th>
<th>HBV neg</th>
<th>HBV pos</th>
<th>HBV pos or neg</th>
</tr>
</thead>
<tbody>
<tr>
<td>AZT + XTC + DTG</td>
<td>TDF + AZT + XTC + DTG</td>
<td>AZT + XTC + LPV/r</td>
<td>TDF + XTC + LPV/r</td>
</tr>
<tr>
<td>If DTG not suitable, AZT + XTC + LPV/r</td>
<td>If DTG not suitable, TDF + XTC + LPV/r</td>
<td>Cont current regimen – address adherence</td>
<td>Refer for TLART</td>
</tr>
</tbody>
</table>

Due to their high genetic barrier, resistance to DTG and PIs develops very slowly. An elevated VL on DTG or LPV/r is therefore more likely to be related to suboptimal adherence. For this reason, a patient should be on DTG or LPV/r for at least **2 years** before considering a switch to second-line.

Confirmed virological failure for a patient on a DTG or PI-based regimen will therefore be: VL > 1000 c/mL on at least **three occasions over the course of two years**, or VL > 1000 c/mL with signs of **immunological or clinical failure** (i.e. declining CD4 and/or opportunistic infections)

**Drug Interactions with DTG**

DTG is the new kid on the block. Please remember these important drug interactions. Check others using [https://www.hiv-druginteractions.org/checker](https://www.hiv-druginteractions.org/checker).

<table>
<thead>
<tr>
<th>Interacting drug</th>
<th>Effect of co-administration</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rifampicin</td>
<td>↓ DTG</td>
<td>Double dose of DTG by adding another 50mg 12hrs after 1st dose</td>
</tr>
<tr>
<td>Polyvalent cations (Mg, Fe, Ca, Al, Zn)</td>
<td>↓ DTG</td>
<td>Ca and Fe must be taken with food and at least 4 hrs apart Antacids must be taken 2hrs after or 6hrs before DTG</td>
</tr>
<tr>
<td>Anticonvulsants: Carbamazepine Phenobarb Phenytin</td>
<td>↓ DTG</td>
<td>Recommend using Valproate or Lamotrigine</td>
</tr>
<tr>
<td>Metformin</td>
<td>↑ Metformin</td>
<td>DTG increases metformin avail. Max. metformin dose 500mg BD</td>
</tr>
</tbody>
</table>
Common ARV Drug Toxicities and Side-Effects

Common side-effects of ARV drugs, by drug

Abacavir
- Hypersensitivity reaction.
  At risk: Presence of HLA B*5701 gene
  Management: Substitute drug and never use again

Atazanavir
- Indirect hyperbilirubinaemia (clinical jaundice).
  At risk: Underlying hepatic disease, hepatotoxic drugs, HBV or HCV
  Management: LPV/r or DRV/r. If boosted PIs are contra-indicated and NNRTIs have failed in first-line ART, consider integrase inhibitors
- ECG PR interval prolongation
  At risk: Conduction disease, other drugs causing PR interval increase
  Management: as above

Dolutegravir
- Insomnia
  Management: take dose in morning
- Nausea & Vomiting
  Management: symptomatic, usually resolves
- Headache
  Management: symptomatic, usually resolves. Don’t miss meningitis
- Weight gain
  Management: dietary advice, careful monitoring

Efavirenz
- Persistent central nervous system toxicity (such as abnormal dreams, depression or mental confusion)
  At risk: Pre-existing mental health condition
  Management: Daytime dosing. May need to switch.

Emtricitabine
- Severe skin and hypersensitivity reactions. Hyperpigmentation of palms and soles
  Management: Limited options. Substitute for 3TC

Lopinavir/Ritonavir
- Diarrhoea, nausea, vomiting
  Management: symptomatic, consider switch to ATV
- Disulfiram-like reaction due to alcohol in Kaletra (42%)
  Management: avoid giving with metronidazole

Nevirapine
- Hepatotoxicity
  At risk: Underlying hepatic disease, hepatotoxic drugs, HBV or HCV
  Management: If severe, substitute with PI and never use NNRTI again
- Hypersensitivity – Stevens Johnson Syndrome
  Management: as above
Tenofovir
- Acute or Chronic Renal insufficiency. Fanconi syndrome
  At risk: Underlying renal disease
  Management: Adjust dose, or preferably change to safer alternative
- Flatulence, nausea, diarrhoea, abdominal discomfort
  At risk: Lactose-intolerant patients
  Management: Treat symptomatically

Zidovudine
- Anaemia, neutropenia, myopathy, lipoatrophy or lipodystrophy
  At risk: Pre-existing compromise
  Management: Substitute

Grading of side-effects of some ARVs
(Note: Only the more common SEs and the ones it is more important to grade are included here.)

### Clinical side-effects

<table>
<thead>
<tr>
<th>Symptom/ Likely Responsible ARV</th>
<th>Grade 1</th>
<th>Grade 2</th>
<th>Grade 3</th>
<th>Grade 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological</td>
<td>Dizziness (do not record as grade 1) - Reassure patient - Confirm EFV is taken before sleeping</td>
<td>Vivid dreams (do not record as grade 2) - Reassure patient - Symptom will go away after a few days</td>
<td>Mood changes or persistent disturbing dreams - Give chlorpromazine 50mg at night</td>
<td>Acute psychosis, hallucinations, confused behaviour - Stop all ARVs, refer to hospital - Do LP to exclude meningitis - If symptoms persist give haloperidol 5mg 12h &amp; orphenadrine 50mg 12h - Only restart ARVs when symptoms resolved using NVP instead of EFV</td>
</tr>
<tr>
<td>Skin rash</td>
<td>Red, itchy - Reassure patient</td>
<td>Maculopapular rash or dry scales - Aqueous cream and 1% Hydrocortisone or Betamethasone</td>
<td>Blisters or moist loss of skin - Stop all ARVs for 1 week - Give chlorpromazine 4mg 8h - When symptoms resolved restart ARVs, using Lopinavir instead of NVP or EFV</td>
<td>Rash effects mucous membranes or eyes, sloughing of skin (like burns) - Refer to hospital - Restart ARVs when patient stable using Lopinavir instead of NVP or EFV</td>
</tr>
<tr>
<td>Allergic reaction</td>
<td>Itch, no rash - Reassure patient</td>
<td>Some urticaria - Give aqueous cream and 1% Hydrocortisone or Betamethasone - Give Allergex 4mg 8h</td>
<td>Generalised urticaria -Stop all ARVs for 1 week - Give Allergex 4mg 8h - Give 1% hydrocortisone or Betamethasone When symptoms resolved restart ARVs using EFV instead of NVP</td>
<td>Anaphylaxis (patient in shock) - Resuscitate patient - Stop all ARVs - Refer to hospital ARVs can be restarted once patient stable but use Lopinavir instead of NVP</td>
</tr>
</tbody>
</table>

HIV – ARV Drug Side Effects
### Lab side effects

<table>
<thead>
<tr>
<th>Symptom/ Likely Responsible ARV</th>
<th>Grade 1</th>
<th>Grade 2</th>
<th>Grade 3</th>
<th>Grade 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevated serum ALT NVP</td>
<td>50-100</td>
<td>100-200</td>
<td>200-400</td>
<td>&gt;400</td>
</tr>
<tr>
<td></td>
<td>Continue ARVs</td>
<td>Reassure patient Continue ARVs if no other problem Recheck ALT in 14 days</td>
<td>Stop NVP Continue ARVs with EFV unless T1 pregnant</td>
<td>Stop NVP - Refer to hospital Continue ARVs with EFV unless T1 pregnant</td>
</tr>
<tr>
<td>Anaemia AZT</td>
<td>Hb 8 – 9.4</td>
<td>7-7.9</td>
<td>6.5 – 6.9</td>
<td>&lt;6.5</td>
</tr>
<tr>
<td></td>
<td>- Continue ARVs</td>
<td>- Reassure patient - Continue ARVs - Monitor FBC again after 14 days</td>
<td>- Stop all ARVs for 1 week - Then continue same regimen - Keep monitoring after 14 days</td>
<td>- Stop all ARVs - Refer to hospital - Consider ABC or TDF</td>
</tr>
<tr>
<td>Neutropenia AZT</td>
<td>Absolute Neutrophils 1-1.5</td>
<td>0.75 – 1.0</td>
<td>0.5 – 0.75</td>
<td>&lt;0.5</td>
</tr>
<tr>
<td></td>
<td>- Continue ARVs</td>
<td>- Reassure patient - Continue ARVs - Monitor FBC again after 14 days</td>
<td>- Stop all ARVs for 1 week - Then continue same regimen - Keep monitoring after 14 days</td>
<td>- Stop all ARVs - Refer to hospital - Consider Abacavir or Tenofovir</td>
</tr>
<tr>
<td>Thrombocytopenia AZT</td>
<td>Platelets 75 – 99x10^3</td>
<td>50 - 75x10^3</td>
<td>20 - 50x10^3</td>
<td>&lt;20x10^3</td>
</tr>
<tr>
<td></td>
<td>- Continue ARVs</td>
<td>- Reassure patient - Continue ARVs - Monitor FBC again after 14 days</td>
<td>- Stop all ARVs for 1 week - Then continue same regimen - Keep monitoring after 14 days</td>
<td>- Stop all ARVs - Refer to hospital - Consider Abacavir or Tenofovir</td>
</tr>
</tbody>
</table>

**Reminder About Nevirapine**

Although nevirapine is no longer used in first line regimens, it is still sometimes substituted in due to side effects, or drug interactions. Remember, however, that you need to know the baseline (nadir) CD4 count in order to use nevirapine safely. Avoid NVP if:

- CD4 nadir >250 for women
- CD4 nadir >400 for men

---

HIV – ARV Drug Side Effects & Reminder about Nevirapine 110
Common Opportunistic Infections (And Some Side-Effects)

Cryptococcal Meningitis (see separate full protocol)

Diarrhoea
- Acute & self-limiting – ORS
- Acute but not self-limiting with cramps & fever – bactrim 480mg 2 tabs bd po x 5d & flagyl 400mg tds x 5d
- Acute with blood in stool – ciprofloxacin 500mg tds po x 5 d or nalidixic acid 500mg qid if suspicion of TB (moxifloxacin is 2nd line TB drug)
- Chronic (>1mo) – send a stool specimen for ova & parasites specifically requesting cryptoisospora belli, cryptosporosis, microsporidiosis.
  Give loperamide 2 tabs stat then 1 after each loose stool & empiric antibiotics as for acute diarrhoea (codeine also works)

Cryptosirosis – consider treating empirically
  Bactrim 2 tabs 6hrly for four weeks plus Ciprofloxacin 500mg BD for one week then Bactrim 2 tabs bd for two years

Microsporidiosis – Albendazole 400mg po BD x 2wks
- Consider giving zinc for 10-14 days
- Drug s/e – give advice re hydration & loperamide

Dermatitis
- Aqueous cream to keep skin moist
- Avoid scented soaps
- Hydrocortisone steroid bd to face, betamethasone or clobetasol to body

Herpes Simplex
- Lips & mild – gentian violet & reassurance that it will resolve in about 2 wks is usually enough
- Genital herpes – Acyclovir 400mg 6hrly po 5-7days; betadine sitz baths
- Remember analgesia

Herpes Zoster
- Gentian violet/betadine/savlon topically
- Acyclovir 800mg 3x/d for 7 days – books say 5x/d but tds is just as effective, easier to remember & cheaper (start in all with active rash, not just <72hrs)
- Analgesia: brufen & panado co
- If eye involved, give chloromycetin ointment & refer to ophthalmologist
- Usually lasts about 2 wks
- If pt gets post herpetic neuralgia, give amitriptyline 25-100mg at night

Nausea/vomiting
- Make sure pt not taking any unnecessary tablets. Many drugs cause nausea & vomiting
- If secondary to ARVs, usually self-limiting. May be enough to just reassure pt.
- Cyclizine 50mg tds orally, metoclopramide 10mg po tds or Cyclizine (valoid) suppository 1 tds PR if very severe
- Giving patient Webcols (alcohol swabs) to sniff is evidence based and works!
• Look out for combination with fever, severe rash, jaundice (hepatitis); abdo pain (pancreatitis); weight loss, mild malaise (hyperlactataemia)
• If ARVs are vomited, repeat the dose

Oesophageal candida
• Fluconazole 200mg po dly for 2wks
• Remember that HSV can also give pain on swallowing &/or retrosternal pain as does reflux (think of this in a well HIV pt)

Oral candida
• Nystatin 1ml to be swished around the mouth for as long as possible 6hrly
• Fluconazole - Only if the above does not work when given correctly

Papular Pruritic Eruption (PPE)
• “Red itchy bump disease”
• Betamethasone steroid cream to skin BD (Hydrocortisone to face if involved)
• Antihistamine tabs

PCP
• Bactrim 3tabs (<60kg) or 4 tabs (>60kg) qid po for 21d
• If hypoxic, give prednisone 80mg/d for 5 days, 40mg/d x 5d then taper
• Give folate to pt on high dose bactrim

Peripheral Neuropathy (PNP)
• If started before ARVs, try Thiamine 100mg po dly
• Remember TB meds, alcohol, B6 deficiency & HIV itself cause PNP
• If secondary to ARVs/TB meds use Amitriptyline 25mg & Pyridoxine 25mg dly
• Increase up to 100mg dly of each
• Inform the pt that meds take time to work
• If patient on d4T change to TDF or AZT if VL LDL. Don’t wait too long!

Rash
• Localised urticarial rash – hydrocortisone steroid cream bd, antihistamine
• Generalised urticarial rash/blisters – stop ARVs until rash resolved then restart, steroid cream bd, antihistamine
• Any mucous membrane involvement or systemic symptoms & a rash – stop ARVs & DO NOT rechallenge with offending drug (consult specialist re regimen)

Vaginal sores
• Do VDRL to exclude syphilis
• If started as painful vesicles, treat for herpes (see herpes simplex)
• Betadine sitz baths can be helpful
• See “Basic Antibiotic guide” for treatment of genital ulcer.

Toxoplasmosis
• This is an important cause of seizures (usually focal) and decreased level of consciousness in a patient with CD4 < 200.
• In the absence of CT scan (often the case) treat empirically with Co-trimoxazole 4 tabs BD for four weeks, then 2 tabs BD for eight weeks, then continued prophylaxis until CD4 > 200 for 6 months and VL LDL.
• A response to therapy should be seen in 7-10 days.
**Cryptococcal Meningitis (CCM)**

CCM is a common OI and responsible for a large number of HIV related deaths, with a case fatality approaching 50% in Southern Africa. It is imperative that this protocol is followed closely to achieve optimal outcomes.

**Symptoms/signs**
Consider in any HIV positive patient presenting with:

<table>
<thead>
<tr>
<th>• Headache</th>
<th>• Unexplained fever</th>
<th>• Nausea and vomiting</th>
<th>• Altered level of consciousness</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Neck stiffness</td>
<td>• Confusion</td>
<td>• Seizures</td>
<td>• Unexplained blindness</td>
</tr>
<tr>
<td>• Diplopia</td>
<td>• Focal neurology</td>
<td>• Abnormal behaviour</td>
<td>• New onset psych symptoms</td>
</tr>
</tbody>
</table>

LP is necessary for aetiological diagnosis. (If focal neurological signs are present a CT brain is ideal to ensure LP is safe. You can also ultrasound the optic nerve diameter if you know how.) Send CSF for microscopy, chemistry and CLAT, and culture.

**Important points about LPs in CCM**
Measure the opening pressure
- Makeshift manometers from Intravenous line sets work, but under-estimate the opening pressure.
- **Helpful hint:** Drop counting: obtaining ≥ 40 drops of free-flowing CSF in 60 s using a 22-gauge spinal needle suggest a high CSF pressure.

Reduce the opening pressure as soon as possible
- As soon as the diagnosis is confirmed, repeat the LP. To improve morbidity & mortality you must reduce opening pressure to 20cm H₂O.
- It is advised to remove 20-30ml of CSF.

**Serial LPs**
- Need for pressure relief should then be dictated by recurrence of symptoms of raised intracranial pressure
- Patients may therefore require daily LPs.

**Cryptococcal Antigen (CrAg) screening**
- In SA, this investigation is triggered automatically in lab for any CD4 < 100.
- The SA HIV Clinicians Society recommends testing everyone with CD4 < 200 as there is added mortality benefit. Have a low threshold for doing this

**Diagnosis & Management**
- Blood CrAg – neg: Initiate ART. No antifungal treatment needed
- Blood CrAg + pos: Do Lumbar puncture
  - CSF negative for any cryptococcal test = Cryptococcal antigenaemia
    - 2 weeks of Fluconazole 1200 mg dly, 8 weeks 800 mg dly, 200mg dly for a minimum of 1 year and discontinue when patient has had CD4>200 and VL suppressed.

*Initiate ART as soon as possible*
CSF positive for any cryptococcal test = Cryptococcal meningitis
(Please use the CCM proforma)

**Induction phase**
- 1 week of Amphotericin B 1mg/kg/day + Flucytosine (5-FC) 100 mg/kg/day in 4 divided doses then 1 week Fluconazole 1200mg/day
- If Amphotericin B unavailable: 2 weeks of Fluconazole 1200mg/day + Flucytosine (5-FC) 100 mg/kg/day in 4 divided doses
- If Flucytosine (5-FC) unavailable: 2 weeks of Amphotericin B 1mg/kg/day + Fluconazole 1200mg/day

**Consolidation phase**
- Fluconazole 800mg daily for 8 weeks

**Maintenance phase (secondary prophylaxis)**
- Fluconazole 200 mg daily for a minimum of 1 year in total and discontinue when patient has had at least 1 CD4 count >200 and VL suppressed

Initiate ART 4-6 weeks after start of antifungal treatment

---

**Amphotericin B and Flucytosine toxicity**
- **Amphotericin B**: Acute kidney injuries, hypokalaemia, hypomagnesaemia, anaemia, febrile reactions and chemical phlebitis.
- **Flucytosine**: Bone Marrow Toxicity. Flucytosine plasma clearance is closely related to creatinine clearance and Flucytosine thus accumulates with impaired renal function; this may lead to increased risk of toxicity.

**Monitoring** (See CCM proforma)
- Day 0: FBC & diff, creatinine, potassium, magnesium
- Day 3: Creatinine, potassium, magnesium. Rpt FBC if low baseline Hb
- Day 7: FBC & diff, creatinine, potassium, magnesium
- Days 10 & 14: Repeat again if using 2 weeks Ampho (i.e. no 5FC)

**Management of toxicity**

*Renal Impairment (Creatinine clearance <50 mL/min)*
- Induction phase doses adjusted to eGFR (Cockroft-Gault equation) in adults

<table>
<thead>
<tr>
<th>Antifungal agent</th>
<th>eGFR &gt; 50</th>
<th>eGFR 10-50</th>
<th>eGFR &lt; 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amphotericin B</td>
<td>1 mg/kg</td>
<td>1 mg/kg</td>
<td>1 mg/kg</td>
</tr>
<tr>
<td>Fluconazole</td>
<td>1200 mg daily</td>
<td>600 mg daily</td>
<td>600 mg daily</td>
</tr>
<tr>
<td>Flucytosine</td>
<td>25 mg/kg/dose 6 hourly</td>
<td>25 mg/kg/dose 12 hourly</td>
<td>25 mg/kg daily</td>
</tr>
</tbody>
</table>

- Management phase doses
  - If Creat > 2xbaseline then omit one day of Ampho and/or pre-hydration may be increased to 1L of NS 8hrly.
  - If Creat improves restart at a dose of 0.7 mg/kg/day and/or alternate day treatment.

**Bone Marrow Toxicity:**
If grade 4 neutropenia (<0.4 cells/L or <400 cells/mm³), reduce Flucytocine dose and repeat. If confirmed stop Flucytosine and replace with fluconazole and consider a second week of Amphotericin B.
Prevention of toxicity
Use the CCM proforma to ensure fluids given regularly and correctly
Amphotericin B: Prehydrate with 1L of Normal Saline containing 20mmol KCl infused over 2 hours. 1200mg KCl bd PO (2 tabs bd po). MgSO₄ 1 g dly (give IV solution orally)

Fluconazole dose adjustment with TB (Rifampicin)
- The SA HIV Clinicians Society no longer recommends this, provided the higher doses indicated are used (800mg for consolidation phase CCM; 1200mg induction for positive serum CrAg).

Fluconazole in pregnancy
- No alterations in the management of CCM are required in pregnancy.
- Fluconazole is teratogenic; therefore women of child bearing age should use effective contraception while on treatment or prophylaxis.
- Patients with Cryptococcal antigenaemia on ART and not Fluconazole have a substantial risk of progression to meningitis, which has a high mortality. Therefore, the benefits of fluconazole outweigh the risks. (A lower dose of 200mg can also be considered in the first trimester.)

Fluconazole “Resistance” Suspected
Recurrent CCM is usually a result of inadequate treatment. In cases of relapse with good adherence, send CSF for fungal culture and susceptibility testing (discuss with the lab to ensure this gets done). Consult an expert Infectious Disease physician if you are unsure.

Managing CC IRIS
Between 15-30% patients with CCM get intracranial cryptococcal IRIS
- Continue ARVs
- Repeat LP to exclude additional pathology, to obtain an isolate for susceptibility testing to fluconazole and to measure ICP
- Treat raised ICP with serial LPs as per usual protocol
- CT scan if focal neurology present
- Give appropriate antifungal therapy
- Prednisone 1mg/kg daily for at least a week if symptoms fail to respond after appropriate initial management. Some patients require prolonged courses of steroids.

Adolescents and Children
South African data indicate an increasing incidence of CM from the age of 10 years onwards. Duration of each phase as per adults.
- Induction phase: Amphotericin B 1 mg/kg/day and Flucytosine as a dose of 100 mg/kg/day divided 6hrly.
- Consolidation phase: Fluconazole 6 mg/kg/day – 12 mg/kg/day (up to 800 mg daily) and
- Maintenance phase: Fluconazole 6 mg/kg/day (up to 200 mg daily)
Tuberculosis

Infant Exposed to TB in Utero

If exposed to DRTB discuss with an expert

Don’t forget relevant HIV PMTCT

Babies born to mother with TB
- Diagnosed in the last 2 months of pregnancy
- No response to TB treatment
- Still AFB positive

Withhold BCG

Investigate all babies for signs of disease:
- CXR
- Gastric aspirate (ideally before baby has first feed)
- Placental examination + histology / culture
- Clinical: RR>60, poor feeding, poor weight gain, HSM

Asymptomatic

- Preventative therapy for six months with:
  - INH 10mg/kg
  - Follow up monthly for weight gain

Symptomatic & TB deemed likely

- Treat with:
  - Rifampicin 15mg/kg
  - INH 10mg/kg
  - PZA 35mg/kg (consult pharmacy re solution)
  - Continue for six months

At end of six months, screen for TB and give BCG 2 weeks later if well
Latent TB
Latent TB infection is a state of persistent immune response to M.tb bacteria without evidence of active disease. Some individuals will go on to develop active TB disease. There are several risk factors that increase individual risk for developing active TB disease. Individuals with significant risk factors should be given TB Preventative Therapy [TPT] to eliminate their latent TB infection. The diagnosis of latent TB is made on history and not Mantoux or IGRA testing as per national policy.

Who qualifies for TPT
Current national guidelines:
1. All HIV positive patients
2. All household contacts under 5 years

Other individuals who may qualify due to 'high-risk' status:
Note: Guidelines for SA are due out in 2020, but you may still make individual treatment decisions for patients in the following categories.
1. All household contacts, especially within the first two years of exposure
2. Immune-compromised individuals: diabetes, individuals on immune-suppressive drugs, HIV exposed babies
3. Silicosis/ex-mine workers

The algorithms that follow are what we consider to be best practice based on current WHO guidelines, draft SA guidelines and applicability to our rural setting.

Applying this approach is an essential part of the more comprehensive **Search Treat and Prevent** approach that is required to drive TB incidence down.

Prophylaxis for child contact of adults with DR TB is different – see DR-TB Preventative Therapy section for details.
TB - TB Preventative Therapy in HIV Positive Children

TB Symptoms
Current cough – Poor weight gain
- Failure to thrive – Ongoing fever – Tiredness or decreased playfulness – Persistent lymph nodes or masses

HIV positive children
- who have never had TPT
- with a new TB contact in the preceding year

Symptoms of TB present AND can produce sputum or get gastric washing
- Send sputum or gastric washing for GXP
  - GXP positive
    - Start TB treatment
    - NB check ARV regimen
  - GXP negative
    - Investigation positive for TB
    - Refer for X-ray or other investigation
      - Investigation negative for TB
      - No symptoms of TB
        - Contra-indications to TPT
          - Signs of TB disease
          - Active liver disease
          - Peripheral neuropathy previous
          - Drug reaction to a TPT drug

Symptoms of TB present AND No sputum or gastric washing
- Refer for X-ray or other investigation

No symptoms of TB
- Repeat symptom screen at every visit

Option 1 – Isoniazid (H) x 6 months

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Daily INH 100mg tab</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 – 3.4</td>
<td>¼ tablet</td>
</tr>
<tr>
<td>3.5 – 4.9</td>
<td>½ tablet</td>
</tr>
<tr>
<td>5 – 7.4</td>
<td>1 tablet</td>
</tr>
<tr>
<td>7.5 – 9.9</td>
<td>1 ½ tablet</td>
</tr>
<tr>
<td>10 – 14.9</td>
<td>2 tablets</td>
</tr>
<tr>
<td>15 – 40</td>
<td>2 tablets</td>
</tr>
<tr>
<td>&gt;40</td>
<td>3 tablets [OR 1 x 300mg tablet]</td>
</tr>
</tbody>
</table>

Option 2 – Only if Efavirenz-based ARV regimen
Daily Rifampicin/Isoniazid (RH) x 3 months

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Daily RH (75/50 tab)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-2.9</td>
<td>¼ tablet</td>
</tr>
<tr>
<td>3-3.9</td>
<td>¼ tablet</td>
</tr>
<tr>
<td>4-5.9</td>
<td>1 tablet</td>
</tr>
<tr>
<td>6-7.9</td>
<td>1 ½ tablet</td>
</tr>
<tr>
<td>8-11.9</td>
<td>2 tablets</td>
</tr>
<tr>
<td>12-15.9</td>
<td>3 tablets</td>
</tr>
<tr>
<td>16-24.9</td>
<td>4 tablets</td>
</tr>
<tr>
<td>&gt;25</td>
<td>2 tablets</td>
</tr>
</tbody>
</table>

Daily RH (150/75 tab)

Option 3 – 3HP
Rifapentine/isoniazid weekly x 3 months

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Rifapentine (weekly)</th>
<th>INH</th>
<th>150mg tabs (weekly)</th>
<th>100mg tabs (weekly)</th>
<th>300 mg tabs (weekly)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-11.9</td>
<td>2</td>
<td>1</td>
<td>2 ½</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>12 – 13.9</td>
<td>2</td>
<td>1</td>
<td>2 ½</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>14 – 17.9</td>
<td>3</td>
<td>1</td>
<td>2 ½</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>18 – 24.9</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>25 – 29.9</td>
<td>4</td>
<td>1</td>
<td>2 ½</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>30 – 49.9</td>
<td>5</td>
<td>1</td>
<td>2 ½</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

NB: Check ARV regimen
ALL HIV positive Adults or Adolescents
- with no previous TPT
- with a new household TB contact in the preceding year
- who have just completed TB treatment
- pregnancy

Symptoms of TB present AND can produce sputum
  - Send sputum for GXP
    - GXP positive
      - Start TB treatment
      - NB Check ARV regimen if contains Alluvia/Dolutegravir* or Nevirapine**
    - GXP negative
      - Test positive for TB
      - Start TB Preventative treatment (TPT)

Symptoms of TB present AND No sputum
  - Refer for X-ray/other evaluation
    - Test positive for TB
    - Start TB treatment

No symptoms of TB
  - Repeat symptom screen at every visit

TB Symptoms
- Any cough
- Night sweats
- Ongoing fever
- Weight loss
- Haemoptysis
- Chest pain
- Shortness of breath
- Persistent lymph nodes/masses
- Chronic back pain

Contra-indications to TPT
- Signs of TB disease
- active liver disease
- peripheral neuropathy
- previous drug reaction to a TPT drug
- excessive alcohol use
- If current pregnancy
  - CD4 ≤ 100 – give TPT now
  - CD4 > 100 – defer TPT to 6 weeks post-partum

TB Preventative Therapy in HIV Positive Adults & Adolescents

Isoniazid (H) x 12 months
[x 6 months if patient has had a previous course of TPT]

<table>
<thead>
<tr>
<th>Weight</th>
<th>Dose</th>
<th>Formulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤40 kg</td>
<td>200mg daily</td>
<td>2 x 100mg tabs</td>
</tr>
<tr>
<td>&gt;40 kg</td>
<td>300mg daily</td>
<td>1 x 300mg tab OR 3 x 100mg tabs</td>
</tr>
</tbody>
</table>
TB Preventative Therapy in High Risk situations

Applicable to HIV negative Household Contacts, Immune-suppression and HIV exposed infants

- **TB Symptoms adults**
  - Any cough – Night sweats – Ongoing fever
  - Loss of weight or not gaining weight – Persistent lymph nodes or masses – Chronic back pain

- **TB Symptoms children**
  - Current cough – Poor weight gain – Failure to thrive – Ongoing fever – Tiredness or decreased playfulness – Persistent lymph nodes or masses

**HIV negative close contact with index TB patient in the preceding year**

OR

**Immune-compromised patient**

- Diabetics
- Patients on chemotherapy or immune-suppressive drugs, silicosis

OR

**HIV-exposed infant**

**Symptoms of TB present AND can produce sputum**

- Send sputum for GXP

**Symptoms of TB present AND no sputum**

- Refer for X-ray/other evaluation

**Start TB Preventative treatment (TPT)**

**Option 1 – adults and adolescents only**

Weekly Rifapentine/Isoniazid (HP) x 3 months

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Rifapentine (weekly)</th>
<th>INH (weekly)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-11.9</td>
<td>2</td>
<td>2 ½</td>
</tr>
<tr>
<td>12 - 13.9</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>14 - 17.9</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>18 - 24.9</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>25 - 29.9</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>30 - 49.9</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>&gt;50</td>
<td>6</td>
<td>3</td>
</tr>
</tbody>
</table>

**Option 2 – Daily Rifampicin/Isoniazid (RH) x 3 months for <8/<25kg**

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Daily RH (75/50 tab)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 - 2.9</td>
<td>½ tablet</td>
</tr>
<tr>
<td>3 - 3.9</td>
<td>¾ tablet</td>
</tr>
<tr>
<td>4 - 5.9</td>
<td>1 tablet</td>
</tr>
<tr>
<td>6 - 7.9</td>
<td>1 ½ tablet</td>
</tr>
<tr>
<td>8 - 11.9</td>
<td>2 tablets</td>
</tr>
<tr>
<td>12 - 15.9</td>
<td>3 tablets</td>
</tr>
<tr>
<td>16 - 24.9</td>
<td>4 tablets</td>
</tr>
</tbody>
</table>

**Option 3 – Daily Isoniazid (H) x 6 months**

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Daily INH 100mg tab</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 – 3.4</td>
<td>¼ tablet</td>
</tr>
<tr>
<td>3.5 – 4.9</td>
<td>½ tablet</td>
</tr>
<tr>
<td>5 – 7.4</td>
<td>¾ tablet</td>
</tr>
<tr>
<td>7.5 – 9.9</td>
<td>1 tablet</td>
</tr>
<tr>
<td>10 – 14.9</td>
<td>1 ½ tablet</td>
</tr>
<tr>
<td>15 – 40</td>
<td>2 tablets</td>
</tr>
<tr>
<td>&gt;40</td>
<td>3 tablets [OR 1 x 300mg tablet]</td>
</tr>
</tbody>
</table>

Not yet SA policy – guideline awaited

Contra-indications to TPT

- Signs of TB disease – current pregnancy and CD4 over 100 – active liver disease – peripheral neuropathy – previous drug reaction to a TPT drug – excessive alcohol use
- defer TPT until 6 weeks post-partum
## TB Definitions

### Exposure

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index patient</td>
<td>The first patient to be diagnosed with new or recurrent TB in a specific household or comparable setting</td>
</tr>
<tr>
<td>Contact</td>
<td>Any person who has been exposed to an index patient</td>
</tr>
<tr>
<td>Household contact</td>
<td>A person who shared the same enclosed living space for at least 8 continuous hours or for frequent prolonged periods with the index case during the 3 months before the current episode started</td>
</tr>
<tr>
<td>Infection</td>
<td>Has inhaled TB. Indicated by positive mantoux</td>
</tr>
<tr>
<td>Disease</td>
<td>Has defined symptoms and/or radiographic changes</td>
</tr>
</tbody>
</table>

### Type of TB

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSTB</td>
<td>Sensitive to the standard first-line regimen consisting of Rifampicin, Isoniazid, Pyrazinamide &amp; Ethambutol</td>
</tr>
<tr>
<td>Mono-resistance</td>
<td>Resistance to only Rifampicin (treated in the same way as MDR TB) or INH (treated with six months of RHZE plus Levofloxacin)</td>
</tr>
<tr>
<td>MDR TB</td>
<td>Multi-drug resistant TB is TB that is resistant to Rifampicin and Isoniazid. See section below on managing MDR TB</td>
</tr>
<tr>
<td>Pre-XDR TB</td>
<td>TB that is resistant to Rifampicin, Isoniazid and one of either the fluoroquinolones or aminoglycosides used to treat MDR TB. This is usually treated in the same way as XDR TB</td>
</tr>
<tr>
<td>XDR TB</td>
<td>Extremely drug resistant TB is TB that is resistant to Rifampicin, Isoniazid, a fluoroquinolone and one of the aminoglycosides previously used to treat MDR TB</td>
</tr>
</tbody>
</table>

### Treatment outcome

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>New case</td>
<td>A patient who has never had treatment for TB or who has taken anti-tuberculosis drugs for less than four weeks</td>
</tr>
<tr>
<td>Retreatment</td>
<td>A patient who has taken treatment for TB before and either relapsed, defaulted or had treatment failure</td>
</tr>
<tr>
<td>Relapse</td>
<td>A sputum smear positive pulmonary TB patient who received treatment and was declared cured (sputum smear negative) at the end of the treatment period and now developed sputum smear positive pulmonary TB again</td>
</tr>
<tr>
<td>Treatment failure</td>
<td>A pulmonary TB patient who is still sputum smear positive at the end of the treatment period</td>
</tr>
<tr>
<td>Defaulter</td>
<td>A patient who completed at least one month of treatment and returns after having interrupted treatment for two months or more, and still with active TB</td>
</tr>
<tr>
<td>Transfer out</td>
<td>A patient already registered for treatment in one district who has been transferred to another to continue treatment</td>
</tr>
<tr>
<td>Moved</td>
<td>Transferred within sub-district</td>
</tr>
<tr>
<td>Chronic case</td>
<td>Patient who remains sputum smear positive after completing a supervised re-treatment regimen</td>
</tr>
</tbody>
</table>
Diagnosing TB in Children

Children most at risk
- < 3yrs of age (immune immature)
- Recent exposure/infection. Usually disease occurs within first year.
- Immunocompromised status of the child (HIV, malnutrition, measles)
- Missed BCG (which protects mainly against severe forms like TBM)

Diagnostic criteria
Any child presenting with symptoms and signs suggestive of pulmonary TB is regarded as a case of TB if there is:
- A CXR suggestive of TB and/or
- History of exposure to an infectious TB case and/or
- Positive Tuberculin Skin Test (TST) e.g. Mantoux

Signs and Symptoms of TB
- Persistent, non-remitting cough (>2/52) not improving, despite oral Abx
- Weight loss or FTT unresponsive to deworming and nutritional support
- Unusual fatigue or decreased playfulness
- Persistent or intermittent fever, especially if >38°C present >14/7 after bacterial infection excluded.
- Painless enlarged mass of mattered LN, usually neck, without a visible cause or response to Abx
- Hepatosplenomegaly

Less common presentations
- Localised chest pain
- Haemoptysis
- Painful limbs of joints
- Flictenular conjunctivitis (raised patch at the junction of the sclera and cornea with surrounding erythema).
- Erythema nodosum

Extrapulmonary TB
- Commonest forms:
  - Cervical lymph adenitis
  - Pleural effusion
  - TB meningitis
  - Miliary TB

- TB meningitis
  Most serious form of TB – be suspicious early
  Typical history
  - Contact with index case
  - Reduced playfulness
  - Decreases appetite often with weight loss
  - Vomiting without diarrhoea
  - Early AM headache
  - Irritability
o Drowsiness/lethargy
o Convulsions
o Behavioural changes

**DIAGNOSTIC TESTS**

**Tuberculin skin testing (Mantoux)**
- Positive TST only indicates infection (takes 4-6 weeks to become positive)
- Mantoux preferred - 0.1ml PPD injected intradermally
- Read transverse diameter of induration (not redness)
- ≥ 10mm (≥ 5mm in child at risk of false negative) is positive
- False negatives: severe malnutrition, HIV infection, miliary TB and TBM, immunosuppressive drugs, incorrect technique
- Once the mantoux has tested positive apply steroid cream to avoid unnecessary scarring

**Chest X-ray**
- Lateral CXR useful to evaluate possible hilar lymphadenopathy
- Most common radiological signs
  - ↑ density in hilar region and/or broad mediastinum (lymph nodes)
  - Compression of the airways, ball valve effect with segmental/lobar hyperinflation, collapse.
  - TB pneumonia
  - Isolated pleural effusions

**GeneXpert**
- Valuable in any child able to produce a sample but try to send TBMC&S as well. Tracheal aspirate can also be sent for GeneXpert.

**Culture**
- Imperative in complicated cases and where drug resistance is a concern
- Useful method to promote cough- 2 puffs ventolin via spacer, 10 min later neb with hypertonic saline, then chest physio if needed
- FNABs & GWs and tracheal aspirates **should be sent for culture.**
- **NB: Gastric washing tips:**
  - Early morning aspirate – 4 hours after food intake
  - **Add an equal amount 4% sodium bicarbonate as the amount of saline that was used for obtaining GW, so as to maintain viability of AFBs for culture**
  - Send two samples on consecutive days if possible
Treating TB in Children

Refer to dosing chart for details of regimens used.

Uncomplicated TB
- All intrathoracic disease in the absence of lung cavities or extensive alveolar consolidation
- Uncomplicated extra-thoracic disease such as TB lymphadenitis, uncomplicated pleural effusions
- This is also known as Regimen 3a
- Children < 8yrs who require treatment for second time need DRTB to be excluded and then treat with Complicated TB Regimen

Complicated TB
- All smear positive TB
- Any case with extensive pulmonary disease or cavitations on CXR
- All children > 8yrs who are < 35kgs
- Severe immunosuppression from HIV or malnutrition
- Extra-pulmonary TB other than TBM or miliary TB (i.e. spine, bone, abdo etc)
- Children who have been previously treated for TB.

TBM or military TB
- Use specific regimen: single phase of 6-9 months of four drugs.
- Also used for Congenital TB infection

Adjunctive steroids
- Who should get?
  - TB meningitis
  - TB pericarditis
  - Severe airway obstruction caused by lymph adenitis
- 2-4mg/kg daily for 4-6 weeks
- Taper over 2 weeks

Follow up
- Follow up monthly for 1st 3 months
- Accurately document wt at each visit – adjust treatment to body weight. Round tablets up – rather give ½ tab more than ½ tab less.
- Manage smear positive kids as adults with repeat sputum at 2/12 & 5/12
- CXR is poor indicator of response. Only recommended in child poorly responsive to Rx

Deterioration on treatment
- Check drug doses
- Check adherence
- Check HIV status (possible IRIS)
- Was child severely malnourished (IRIS)
- Is there a reason to suspect MDR TB?
Drug-related adverse events
- Much less common in children
- Most common and severe is hepatotoxicity
  In presence of liver tenderness, hepatomegaly or jaundice do LFTs
  Treat like adults
- Peripheral neuropathy may occur in malnourished or child on ARV’s
  Supplement pyridoxine in older children with Pyridoxine 12.5mg daily <5yrs or
  25mg daily >5yrs. If too young to swallow tabs, use MVT
  Supplement malnourished, HIV-infected and adolescents

NB checklist in child with TB
- Exclude HIV
- If HIV-infected:
  - Check if on ARVs or refer to HIV clinic
  - Make a dose-adjustment plan if child on Protease Inhibitor!
  - Remember that Rifampicin has a two-week tail for drug interactions
- Make a note in the RTHC
- Ask about other children in same house and refer for evaluation
- If the child is >8yrs they need adult treatment or Reg 3B
- Adjust doses as the child gains weight

Be especially concerned about these children
- Smear positive case after 2 months TB treatment who failed (or deteriorated on) first-line anti-TB drugs to which they were adherent. (Treatment failure or relapse within 6 months of treatment.)
- Any severely ill child with TB who failed or got worse on TB treatment
- Defaulted TB treatment (>2 months)
- Treatment interruptions (<1 month) or who relapse while on TB treatment or at the end of treatment
- Recurrent TB disease after completion of TB treatment (retreatment case)
### TB Drug Dosing Chart for Children <8 years of age or <25 kg (2021)

<table>
<thead>
<tr>
<th>Body Weight (kg)</th>
<th>Uncomplicated TB disease (excluding TBM / military TB)</th>
<th>Complicated TB disease (excluding TBM / military TB)</th>
<th>TB meningitis (TBM) or miliary TB</th>
<th>Body Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intensive phase 2 months</td>
<td>Continuation phase 4 months</td>
<td>Intensive phase 2 months</td>
<td>Continuation phase 4 months</td>
</tr>
<tr>
<td>2-2.9</td>
<td>RH 75/50/150 dispersible tablet (scored)</td>
<td>RH 75/50 dispersible tablet</td>
<td>RHZ 75/50/150 dispersible tablet</td>
<td>RHZ 75/50/150 dispersible tablet</td>
</tr>
<tr>
<td>3-3.9</td>
<td>½ tab or 3ml</td>
<td>1ml</td>
<td>½ tab or 3ml</td>
<td>1ml</td>
</tr>
<tr>
<td>4-4.9</td>
<td>1 tab or 4ml</td>
<td>2ml</td>
<td>1 tab or 4ml</td>
<td>2ml</td>
</tr>
<tr>
<td>5-5.9</td>
<td>2 tab or 8ml</td>
<td>4ml</td>
<td>2 tab or 8ml</td>
<td>4ml</td>
</tr>
<tr>
<td>6-6.9</td>
<td>½ tab or 4ml</td>
<td>8ml</td>
<td>½ tab or 4ml</td>
<td>8ml</td>
</tr>
<tr>
<td>7-7.9</td>
<td>3 tab or 12ml</td>
<td>16ml</td>
<td>3 tab or 12ml</td>
<td>16ml</td>
</tr>
<tr>
<td>8-8.9</td>
<td>3½ tab or 14ml</td>
<td>20ml</td>
<td>3½ tab or 14ml</td>
<td>20ml</td>
</tr>
<tr>
<td>9-9.9</td>
<td>4 tab or 16ml</td>
<td>24ml</td>
<td>4 tab or 16ml</td>
<td>24ml</td>
</tr>
<tr>
<td>10-11.9</td>
<td>4½ tab or 18ml</td>
<td>28ml</td>
<td>4½ tab or 18ml</td>
<td>28ml</td>
</tr>
<tr>
<td>11-12.9</td>
<td>5 tab or 20ml</td>
<td>32ml</td>
<td>5 tab or 20ml</td>
<td>32ml</td>
</tr>
<tr>
<td>12-13.9</td>
<td>5½ tab or 22ml</td>
<td>36ml</td>
<td>5½ tab or 22ml</td>
<td>36ml</td>
</tr>
<tr>
<td>13-14.9</td>
<td>6 tab</td>
<td>40ml</td>
<td>6 tab</td>
<td>40ml</td>
</tr>
</tbody>
</table>

H = Isoniazid, R=Rifampicin, Z=Pyrazinamide, E=Ethambutol, Eto=Ethionamide

** Speak to pharmacy about making a PZA, EMB and Eto solution

Uncomplicated TB disease in children

TB cases with low bacillary load such as PTB with minimal parenchyma involvement, uncomplicated intra-thoracic TB and/or lymphadenopathy or pleural effusions

Complicated TB disease in children

New smear positive pulmonary TB, cavitative TB, extensive or severe TB (excl. TBM or miliary TB) or HIV infection, excluding DR TB (ie drug susceptible or presumed drug susceptible)
Diagnosing TB in Adults

Tuberculosis is rampant in many rural communities. Incidence varies slightly across the country, as does the rate of drug resistance. Many of the cases present diagnostic challenges. There is a high rate of co-infection with HIV. We see many patients who have defaulted their treatment or who have TB for the second or third time. It is therefore very important that these patients are managed consistently and followed up correctly. These notes are to assist that by providing some reminders.

Diagnosis

- Most “TB suspects” should come to you via the TB Point where they will have had sputum sent, a CXR done and an HIV test. (If you don’t have a “TB Point” consider setting up some system to fast track coughing patients.)
- Please ensure that all patients newly diagnosed with TB have been strongly encouraged to have an HIV test!
- Please resist the temptation to diagnose TB based on CXR and symptoms alone. While this may sometimes be necessary, an attempt to follow the guidelines is necessary for procedural correctness and intellectual honesty.

A note on CXRs:
1. Most hospital diagnosed patients will have had a CXR as part of their work-up
2. Do not repeat CXR simply to look for resolution if the patient is improving clinically. **Do not repeat the CXR within 4 weeks** (radiological changes resolve slower than clinical signs) unless the patient deteriorates.
3. Repeated CXRs may be useful for:
   a. Suspected complications, e.g. a breathless patient needing specific treatment (pneumothorax or pleural effusion).
   b. Frequent or severe haemoptysis.
   c. To help in diagnosing other lung diseases.

A symptom-based approach is a useful screening tool: the presence of two or more of cough, LOW, fever or night sweats has a sensitivity of 85%, but is only 53% specific. Its negative predictive value is 98.5% however.

Helpful investigations / diagnostic approaches include:
1. **GeneXpert** is the first line investigation
2. Do a Urine LAM on all admitted HIV positive patients
3. CRP (don’t overuse this, but checking resolution on treatment is helpful)
4. ESR if HIV negative – do NOT use if HIV positive
5. Broad spectrum antibiotics (e.g. amoxicillin for 10 days)

Please Also Send **TBMC&S** on The Following Patients
1. Ideally all “GeneXpert negative” empiric TB diagnoses
2. Empyema (send standard MC&S as well)
3. Gastric washings in children (send Culture and GeneXpert)

Send an LPA for:
1. GeneXpert Positive Rifampicin resistant (ie treating for DRTB)
2. Patients remaining sputum positive at the end of intensive phase
**More on GeneXpert**
- Picks up 23 different commonly occurring rifampicin-resistance mutations
- High specificity: Didn’t pick up 20 non-tuberculosis mycobacteria spp in trials
- Sensitivity: 100% of smear-positive culture-positive cases
- ~72% smear-negative culture-positive cases - Increases to ~84% if second specimen sent
- So, very sensitive – but false negatives do occur
- Very specific (practically no false positives for MTB or Rif resistance)

It is expensive, so usually only one is indicated, although there are occasional cases where a single repeat is warranted. It can be used on sputum, CSF, pus, purulent aspirates (pleural, ascetic, joint) but not clear fluids, blood, urine or stool

**Adult TB – Difficult Diagnosis Algorithm**

Despite following the diagnostic guidance above it may remain very difficult to confirm a diagnosis of TB, especially in sick HIV infected individuals. The following “WHO smear negative algorithm” which has been adapted for the GeneXpert era is extremely helpful and has been proven in trials to improve outcomes. Please use it on appropriate admitted patients!

**Notes:**
- A CRP may be useful for patients being worked up as out-patients, but less so for in-patients (i.e. save money and don’t do it)
- “Seriously ill” in the algorithm below is effectively anyone requiring admission.
Admitting TB Patients

Who to admit:
1. Any patient diagnosed with TB who is too weak to walk/go home/take treatment easily.
2. Patients who need regular monitoring, such as in drug induced liver injury.
3. Defaulters. It is often worthwhile to admit defaulters to TB ward to help work through their issues. Usually they need admitting only for a few days, but repeat defaulters may benefit from a longer stay.

Avoid admitting patients for workup who are relatively well.

Where to admit
1. Admit coughing patients who have taken less than 48 hours treatment to the High Risk Coughing Room in General Ward.
2. Patients who have taken more than 48 hours treatment and who do not have significant cavitatory disease are far less infectious and can be admitted wherever there is space.
3. EPTB patients can be admitted to a general bed or to the HRC Room.

Ensure the following on admission
1. All patients need to have the appropriate TB medication prescribed as per the guidelines. Please fill in the blue TB card when starting treatment.
2. The TB Point staff must be informed about all new patients so they can be notified.
3. Check that patients who need TBMC&S or LPA have this sent (see list on previous pages). Send sputum or pus.
4. Check that patients already on HAART have it with them. If not yet on ART they must receive counselling in the ward.
5. Ensure the prescription chart is completed properly – the correct dose of TB treatment as well as VitBCo, Cotrimoxazole 2 tab daily if HIV positive, nystatin drops if oral candida (the other common stage 3 condition) etc

Ensure the following before discharge
1. The sensitivities should be known – ideally GeneXpert result or TB MC&S result or at least printout must be obtained and checked.
2. All patients should be discharged via the TB Point before going home.
3. When writing the discharge summary in the patient held record, please make sure you have recorded the basis of diagnosis and treatment start date to make it easy for the person seeing the patient on subsequent visits.
Extra-Pulmonary TB (EPTB)

The most common types of EPTB (all of which we see here) are:

- TB meningitis
- TB lymphadenitis
- Miliary tuberculosis
- TB Pleural effusion
- Tuberculous empyema
- Tuberculous pericardial effusion
- TB abdomen
- TB spine

The basic principles of treatment for PTB also apply to extra-pulmonary forms of the disease (EPTB). In severe disease, longer therapy may sometimes be necessary. Many specialists strongly believe that treatment for severe forms of EPTB (meningitis, miliary, pericarditis) should be given for 9 months instead of the WHO recommended 6 months regimen. WHO says 9 months for TB spine, some say 12. It is the continuation phase that is extended – from 4 months to 7 months. Others disagree, arguing it is paucibacillary. There is little evidence either way. The decision to extend treatment should only be made after individual assessment of the patient. Judge the clinical, radiological and if HIV positive, the immunological recovery and discuss with a senior if unsure. Bacteriologic evaluation of EPTB may be limited by the relative inaccessibility of the sites of disease.

The use of adjunctive therapies such as surgery and corticosteroids is more commonly required in EPTB than in PTB. Corticosteroid treatment is often used in treating some forms of EPTB, specifically meningitis and pericarditis. Depending on the severity of disease, we usually give one month of 2mg/kg of prednisone and wean it over the course of the second month. Avoid steroids for pericarditis in HIV positive patients as net risk outweighs benefit there.

TBM

Diagnosis rests on clinical grounds and lumbar puncture to examine cerebrospinal fluid and the following features indicate a positive test:

- Clear CSF
- Elevated pressure
- High levels of protein (>1g/l)
- High lymphocyte count (30-300/mm³)
- Low glucose

Be wary of diagnosing TBM based on high CSF protein alone. Consider other causes.

Give 2mg/kg prednisone in TBM – as noted above. Delay weaning until two completed months if seriously ill for majority of first month. Ensure audiology and OT follow up
MILIARY TB
Miliary TB is an under-diagnosed cause of end stage wasting in HIV-positive individuals.

Diagnosis
Chest X-ray shows diffuse, uniformly distributed, small miliary nodules ("miliary" means "like small millet seeds"). Full blood count may show pancytopenia (this may also be seen as a result of HIV). Liver function tests may be abnormal. Bacteriological confirmation is sometimes possible from sputum, CSF, or bone marrow.

TB PLEURAL EFFUSION
Typical clinical features are chest pains, breathlessness, tracheal and mediastinal shift away from the side of the effusion and decreased chest movement and stony dullness on percussion on the side of the effusion.

Diagnosis
- Chest X-ray shows unilateral, uniform white opacity, often with a concave upper border.
- Pleural aspiration: the fluid is straw coloured, an exudate, protein content > 30g/l and is usually straw coloured, and the white cell count is high [1 000 - 2 500 per mm$^3$] with predominantly lymphocytes, the Adenosine Deaminase (ADA) which is a measure of the lymphocyte count is raised > 30 IU. Since the number of bacilli present is relatively small, AFB are not usually seen on microscopy of centrifuged specimens of pleural fluid, however, culture may be positive.

Differential diagnosis of an exudative pleural effusion includes malignancy, post-pneumonic effusion and pulmonary embolism.

TB PERICARDIAL EFFUSION
Diagnosis usually rests on suggestive systemic features and ultrasound:
- Cardiovascular symptoms include: chest pain, shortness of breath, cough, dizziness and weakness due to low cardiac output, leg swelling, right hypochondrial pain (liver congestion), abdominal swelling (ascites).
- Cardiovascular signs include: tachycardia, low blood pressure/pulsus paradoxus, raised jugular venous pressure, impalpable apex beat, distant heart sounds, pericardial friction rub, signs of right-sided heart failure (eg, hepatosplenomegaly, ascites, and oedema).
- CXR may show a large globular heart, clear lung fields, and pleural effusion.
- ECG may show tachycardia, flattening of ST and T waves, low voltage QRS complexes.

Treatment is the same as for all types of TB but corticosteroids can be added if the patients is HIV negative. (In HIV positive patients, the risk of cancers may outweigh the benefits conferred by steroid treatment.) Pericardiocentesis is not necessary for the resolution of TB pericardial effusion. In cases of cardiac tamponade the effusion should be aspirated under supervision of someone who has done this before. Inadequately treated pericarditis may lead to constriction.

Note: In high TB/HIV prevalent populations, TB is the most likely treatable cause of pericardial effusion. The differential includes hypothyroidism and uraemia.
TB OF THE SPINE

- Occurs in children, usually within three years of primary infection, & adults.
- It affects the intervertebral disc. As the disease develops, the vertebral body adjacent to the disc space is affected; an abscess is formed and spreads either forward towards the mediastinum or the retroperitoneal space, to the vertebral body with compression of the spinal cord, or back along the vertebral column eventually appearing as a subcutaneous "cold" abscess.
- Collapse of adjacent vertebral bodies affected by tuberculosis may lead to angulated kyphosis. More than one disc may be involved.
- Thrombosis of the anterior spinal artery caused by the inflammation may lead to transverse myelitis and paralysis.

Clinical features of vertebral tuberculosis are:

- Back pain, stiff back, reluctance to bend the back
- Referred pain radiating out from the site of origin (cervico-brachial, intercostals, crural, sciatic)
- Localised swelling, obvious lump or abnormal curvature of the spine
- A child that refuses to walk, paralysis or weakness of the lower limbs due to pressure on the spinal cord.

Physical examination is non-specific until complications (gibbus, cold abscess, and neurological signs) appear. X-rays of the spine show disc space narrowing and erosion of the adjacent vertebral bodies, wedge shaped collapse and angulation.

Zithulele TB Spine Suspicion Score for patients with back pain

- It can be difficult to decide whether you think a patient has early TB spine or not. The physio department have developed a “TB spine suspicion score.”
- It’s not a formally validated measure but has proven useful in our context for helping determine how red the red flag back pain is!
- A score of 13 or more is significant.
- Any back pain that is worrying but which scores lower should be labelled “spine under suspicion” so it doesn’t fall off the radar as “cleared” in subsequent visits.

| HIV: Positive no ARV (2); ARV between 0-6 mo (2); On ARV > 6mo (1) | 2 |
| TB contact / Previous or current TB | 2 |
| Recent significant loss of weight | 1 |
| Demonstrates site of pain with finger/s not hand | 3 |
| Notable localised muscle spasm | 3 |
| Altered sensation or muscle power in limbs or trunk | 3 |
| Back pain wakes them at night | 2 |
| Pain not related to movement | 3 |
| Age 25-45 and more than 6 visits to clinic for back pain over last 6mo | 2 |
| CRP raised in absence of other obvious infection | 3 |
| Change in ability to do physical ADLS (water, wood, home DIY, farming) | 1 |

Note: See comment on treatment duration in EPTB intro. We treat for between 9 and 12 months, but err on the side of 12 months, consistent with practice at BOH.
Adult DS-TB Drug Doses

<table>
<thead>
<tr>
<th>Weight</th>
<th>2 months intensive phase (RHZE 150, 75, 400, 275)</th>
<th>4 months continuation phase (RH 150 / 75)</th>
<th>(RH 300 / 150)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-37kg</td>
<td>2 tabs</td>
<td>2 tabs</td>
<td>--</td>
</tr>
<tr>
<td>38-54kg</td>
<td>3 tabs</td>
<td>3 tabs</td>
<td>--</td>
</tr>
<tr>
<td>55-70kg</td>
<td>4 tabs</td>
<td>--</td>
<td>2 tabs</td>
</tr>
<tr>
<td>&gt;70kg</td>
<td>5 tabs</td>
<td>--</td>
<td>2 tabs</td>
</tr>
</tbody>
</table>

Timing of HAART in TB

Unless there is a compelling reason to do otherwise, the following guide is helpful:

**CD4 < 50 or MDR TB**: Start HAART two weeks after initiation of TB treatment unless TBM or CCM. Continue to work on adherence if concerns over patient readiness.

**CD4 50-200**: Initiate HAART at about 1 month if clinically stable. If concerned about clinical state, rather start after two weeks TB treatment. Can afford to pay a little more attention to readiness if concerns, though.

**CD4 > 200**: Ideal to delay until end of intensive phase.

**TBM or CCM**: Delay HAART initiation until 4-6 weeks treatment completed

Monitoring of Patients on TB Treatment

(SA National Guidelines)
Note: All patients who are diagnosed on GeneXpert need a smear to assess whether they are also smear positive. This follow up algorithm applies to those.

![Monitoring of Patients on TB Treatment](image)
**Notes:**
1. In HIV positive patients who have slow immune recovery (often persistent TB LN) or who experience TB IRIS, a prolonged course of treatment may be warranted. If unsure, get advice from a senior, a consultant or the HIV Hotline.

## TB Defaulters

TB treatment defaulters are a challenging problem. Good counselling and support can help reduce the risk of defaulting. Refer to the algorithm below as a guide to managing those who come back to care.

### IF THE PATIENT INTERRUPTED TREATMENT FOR LESS THAN 1 MONTH

1. Trace the patient
2. Establish the cause for interruption of treatment
3. Address the problem or concerns/ counsel patient
4. Continue treatment and add the missed doses at the end of the treatment phase
   - If the interruption occurred during the intensive phase, the duration of this phase must be extended by the number of days that the patient did not take treatment.
   - If the interruption occurred during the continuation phase, the duration of this phase must be extended by the number of days that the patient did not take treatment.

### IF PATIENT INTERRUPTS TREATMENT FOR 1 – 2 MONTHS

<table>
<thead>
<tr>
<th>ACTION 1</th>
<th>ACTION 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Trace the patient</td>
<td>If Xpert positive and Rif sensitive</td>
</tr>
<tr>
<td>2. Establish the cause for interruption of treatment</td>
<td>• Continue treatment and add the missed doses at the end of the treatment phase</td>
</tr>
<tr>
<td>3. Address the problem or concerns/ Counsel patient</td>
<td>If Xpert positive and Rif resistant</td>
</tr>
<tr>
<td>4. Collect sputum specimen for Xpert</td>
<td>• Stop treatment</td>
</tr>
<tr>
<td>5. Continue treatment and review results of the tests</td>
<td>• Register patient as “RR-TB”</td>
</tr>
<tr>
<td></td>
<td>• Refer to the MDR-TB treatment initiating site for further management</td>
</tr>
</tbody>
</table>

### IF PATIENT INTERRUPTED TREATMENT FOR TWO MONTHS OR MORE (LOST TO FOLLOW UP)

<table>
<thead>
<tr>
<th>ACTION 1</th>
<th>ACTION 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Trace the patient</td>
<td>If Xpert positive and Rif sensitive</td>
</tr>
<tr>
<td>2. Establish the cause for interruption of treatment</td>
<td>• Register as “Treatment after loss to follow up”</td>
</tr>
<tr>
<td>3. Address the problem or concerns/ Counsel patient</td>
<td>• Restart Regimen 1</td>
</tr>
<tr>
<td>4. Collect sputum specimen for Xpert</td>
<td>Monitor as usual until treatment is completed</td>
</tr>
<tr>
<td>5. Do not start treatment, wait for the results</td>
<td>Follow up to ensure the patient has been successfully referred</td>
</tr>
<tr>
<td></td>
<td>If Xpert positive and Rif resistant</td>
</tr>
<tr>
<td></td>
<td>• Register patient as “RR-TB”</td>
</tr>
<tr>
<td></td>
<td>• Refer to the MDR-TB treatment initiation site for further management</td>
</tr>
<tr>
<td></td>
<td>Monitor as usual until treatment is completed</td>
</tr>
<tr>
<td></td>
<td>Follow up to ensure the patient has been successfully referred</td>
</tr>
</tbody>
</table>
## TB Drug Side Effects

<table>
<thead>
<tr>
<th>Side effect</th>
<th>Drug(s) probably responsible</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaemia / leucopenia / neutropenia / thrombocytopenia</td>
<td>Linezolid</td>
<td>Investigate for other causes. If Linezolid, withdraw ± rechallenge. May need to change regimen</td>
</tr>
<tr>
<td>Arthritis / arthralgia</td>
<td>Pyrazinamide, Fluoroquinolones</td>
<td>Aspirin, NSAIDs, physio May need withdrawal</td>
</tr>
<tr>
<td>Diarrhoea</td>
<td>PAS</td>
<td>Assess for other causes, rehydrate, assess electrolytes, consider substitution</td>
</tr>
<tr>
<td>GIT: Anorexia, nausea, abdominal pain</td>
<td>Rifampicin</td>
<td>Give tablets last thing at night</td>
</tr>
<tr>
<td>Hypothyroid</td>
<td>Ethionamide, occ. PAS</td>
<td>Thyroxine &amp; monitor TSH, may need dose adjustment</td>
</tr>
<tr>
<td>Jaundice</td>
<td>Most anti-TB drugs</td>
<td>Follow drug induced liver injury protocol</td>
</tr>
</tbody>
</table>
| Nausea & Vomiting                             | Most anti-TB drugs, esp ethionamide | Take seriously – important cause of poor adherence  
Explore other causes  
Add anti-emetics,  
Give IV fluids if necessary  
Separate dosing from others |
| Orange / red urine                            | Rifampicin                  | Reassurance                                                                                                                              |
| Peripheral neuropathy                         | Isoniazid / Linezolid / Terizidone | Pyridoxine 25-100mg dly  
Consider Gabapentin  
Avoid TCAs in DRTB |
| Psychosis or depression                       | Terizidone or hdINH          | Control psychosis with haloperidol; consult with expert  
Avoid TCAs for depression                                                                                                                 |
| QT prolongation                               | Bedaquiline, Moxifloxacin, Clofazimine | If 470-500ms check TSH, electrolytes, monitor weekly  
If >500ms, recheck ECG, do as above, withhold drugs till improves                                                                            |
| Seizures                                      | Terizidone or hdINH          | CT Brain, anti-epileptic drugs, consider drug switch                                                                                     |
| Skin Hyperpigmentation                        | Clofazimine                 | Counselling and support – will resolve once treatment stopped                                                                             |
| Skin Ichthyosis (Dry skin)                    | Clofazimine                 | Emollient creams                                                                                                                          |
| Skin Rash                                     | Most anti-TB drugs           | Follow skin rash protocol                                                                                                                |
| Visual impairment                             | Ethambutol / Linezolid       | Consult ophthalmologist                                                                                                                  |
Drug Induced Liver Injury (TB-DILI)

Management guide based on Management of suspected drug-induced rash, kidney injury and liver injury in adult patients on TB treatment and/or antiretroviral treatment from MIC, UCT (2020). Full guide is available here or on HIV/TB Hotline app.

DILI CLASSIFICATION

Potential DILI requires monitoring:
- Clinically well with elevated ALT <200iu/l and total bilirubin <34umol/l. Monitor wkly

DILI requiring cessation of drugs:
- Asymptomatic but ALT >200iu/l irrespective of total bilirubin
- Symptoms plus ALT>100 or total bilirubin >34umol/l

[Symptoms = nausea, vomiting, abdo pain, malaise, RUQ tenderness, jaundice]

NEXT STEPS

Potential DILI
1. Repeat ALT and Bilirubin in one week
2. If improves, stop monitoring
3. Otherwise, continue weekly monitoring with further investigation if not better after 4w
4. If meets threshold for drug cessation treat acc to that protocol

DILI requiring drug cessation
1. Admit patient to hospital
2. Stop all TB drugs, Bactrim, Fluconazole, Augmentin and ART (see box)
3. Do full LFT and calculate ratio
   Ratio = ALT/ULN divided by ALP/ULN
   [upper limit normal]
4. Do INR and blood glucose

Exclude other causes of liver dysfunction

Hepatocellular enzyme pattern
ALT ≥3 times ULN, ratio ≥5

Check:
1. Hep A IgG
2. Hep B Ser
3. Hep B core IgM Ab
4. Herpes simplex virus
5. IRIS

Cholestatic enzyme pattern
ALP ≥2 times ULN, ALP/ULN Ratio > 2 but < 5

Check:
1. Abdo ultrasound to excl obstructive cause eg lymphoma, TB nodes, other
2. Sepsis
3. HIV cholangiopathy
4. IRIS
5. Alcohol history (for mixed picture)

RE-CHALLENGE

Quick check:
1. TB diagnosis confirmed / likely
2. Other causes liver dysfx ruled out

DO NOT rechallenge if patient had acute encephalopathy or coagulopathy

Day 1:
- Add RIFAMPICIN 450 or 600mg depending on weight

Day 3:
- Check ALT, Bilirubin

Day 4-6:
- If ALT<100, add INH 300mg daily

Day 7:
- Check ALT, Bilirubin

Day 8:
- If ALT<100, consider PZA rechallenge, esp if TBM or other drug intolerance. Omit if in continuation phase

Day 10:
- Check ALT. If <100 = success

Stop bridging therapy
Monitor ALT weekly for 4 weeks

TB treatment regimen for patients with drug susceptible TB when a first line drug is omitted

<table>
<thead>
<tr>
<th>Drug</th>
<th>Regimen</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIF</td>
<td>Use short course (9mo)</td>
</tr>
<tr>
<td></td>
<td>RR-TB regimen incl INH</td>
</tr>
<tr>
<td>INH</td>
<td>RIF, Levo/Moxi, EMB</td>
</tr>
<tr>
<td></td>
<td>x 9-12 months</td>
</tr>
<tr>
<td></td>
<td>(6mo if PZA included)</td>
</tr>
<tr>
<td>PZA</td>
<td>RIF, INH, EMB</td>
</tr>
<tr>
<td></td>
<td>x 9 months</td>
</tr>
</tbody>
</table>

Discontinuing ART: NNRTI-based regimen: Stop NNRTI first and NRTIs 5-7 days later. If in liver failure, stop all ART immediately. PI based regimen: Stop all ART at once.
Skin Reactions Secondary to TB Drugs

Management guide based on Management of suspected drug-induced rash, kidney injury and liver injury in adult patients on TB treatment and/or antiretroviral treatment from MIC, UCT (2020). Full guide is available here or on HIV/TB Hotline app.

Assess rash severity

- Systemic illness / feeling unwell
- Fever
- Hepatitis
- Skin blistering
- Eosinophilia
- Mucosal involvement

1. If ANY features present, stop ALL TB treatment, ART and co-trimoxazole
2. Wait for rash and symptoms to SETTLE
3. Once settled, start a “skin friendly” regimen:
   - Levofoxacin (15-20mg/kg, max 1000g) PO daily
   - Linezolid 600mg PO daily.
   - Terizidone 10-15mg/kg daily (max 750mg, caps=250mg)
   - Avoid Linezolid if Hb<8g/dl – rather use Amikacin (15mg/kg dly IM/IV)
   - Avoid Amikacin if eGFR < 60ml/min or raised INR
4. Monitor patient for at least 2 weeks before considering rechallenge
5. Consider re-challenge once diagnosis confirmed and sensitivity confirmed

Re-challenge

- To be done in hospital. Monitor for rash, fever, symptoms of anaphylaxis daily
- Discontinue drug if even mild rash develops
- Monitor ALT and Creat 3 times a week

Schedule:
Day 1  Rifampicin 75mg daily
Day 2  Rifampicin 300mg daily
Day 3  Rifampicin 600mg daily (450mg if <60kg)
Day 5  INH 50mg daily
Day 6  INH 100mg daily
Day 7  INH 300mg daily
Day 9  PZA 250mg daily
Day 10 PZA 1g daily
Day 11 PZA 25mg/kg/day (max 2g)

Rechallenge with Ethambutol if intolerant to any of the above three drugs
Day 12  Ethambutol 100mg
Day 13  Ethambutol 400mg
Day 14  Ethambutol 15mg/kg/day (max 1200mg)

If patient tolerates rechallenged drugs, stop background regimen
Decide duration of treatment based on final regimen (see DILI protocol)
Do NOT rechallenge co-trimoxazole
Call HIV Hotline if any uncertainty about safest course of action.
**Drug Resistant TB**

We manage DR-TB on an out-patient basis, after a short admission to ensure the patient is stable and properly managed. It is important that we provide high quality care to these patients to maximise good outcomes. Try to familiarise yourself with the November 2019 DR-TB guidelines, which are available electronically.

**Step 1**  **Diagnosis.** Usually based on GeneXpert (NB see algorithm)

**Step 2**  **Further tests.** Patients diagnosed with DR TB need a further specimen sent for LPA, labelled **DR-TB reflex.** This will be tested to confirm first-line resistance (to R & H) and second-line resistance (to quinolone and injectable) and helps us choose the correct regimen. **Baseline bloods** should be sent for FBC, CMP, U&E and ALT (and CD4 and HepBSAg if HIV positive not yet on ART +—VL if on ART). **Pregnancy test** (all pre-menopausal women), **baseline CXR** and **baseline ECG** are mandatory before starting treatment.

**Step 3**  **Notify.** The patient needs to be notified at TB Point where they are entered into the DR-TB register. Please make sure that TB Point is informed.

**Step 4**  **Initiate treatment.** Since August 2018 South Africa has implemented an injection-free short course regime. Please use the pro-forma MDR TB prescription page which has all the drugs on it. Please check doses on the dosing table from the National Guidelines below. If HIV positive, prepare to start HAART (usual regimens) after 2 weeks.

**Step 5**  **Arrange DG.** All DR-TB patients qualify for a temporary DG – usually given for about a year. Please arrange this while they are in the ward.

**Step 6**  **Home visit.** A home visit needs to be conducted by the TB Nurse (preferably with the Social Worker) to assess home circumstances, access to nearest clinic, sleeping arrangements, conduct education and physically trace contacts.

**Step 7**  **Follow up LPA result.** This should be available within a week and will guide whether patient continues on the new short-course or adapted long course DR TB treatment regimen.

**Step 8**  **Plan for discharge.** If the patient is clinically well enough to be managed at home, they can go home if all the steps above have been attended to. If they are too sick, too far away or have an unsuitable home environment they should remain in hospital until they are stronger and/or culture negative.

**Step 9**  **Discharge and follow up.** A plan needs to be made for how and where the patient will collect their drugs (including ARVs) and for TB Point to check that the required monthly smears and cultures are being sent. The DR-TB folder and database needs to be updated with blood and culture results on discharge.
Decide which DR TB Regimen to use

- Send sample for DR-TB (Resist-DST testing)
- If DR-TB present, refer to line 2.
- Drug resistant TB regimen includes the following drugs:
  - Rifampicin
  - Isoniazid
  - Ethambutol
  - Pyrazinamide
  - Streptomycin

- If DR-TB not present, continue normal treatment.

- If LPA result is inconclusive, send sample for culture.
- If LPA result is positive, send sample for DST.
- If LPA result is negative, start second-line drugs.

- If DR-TB resistant, send sample for DST.
- If DR-TB susceptible, send sample for culture.

- If DR-TB resistant, start second-line drugs.
- If DR-TB susceptible, continue normal treatment.

- If LPA result is inconclusive, send sample for culture.
- If LPA result is positive, send sample for DST.
- If LPA result is negative, start second-line drugs.

- If DR-TB resistant, send sample for DST.
- If DR-TB susceptible, continue normal treatment.

- If LPA result is inconclusive, send sample for culture.
- If LPA result is positive, send sample for DST.
- If LPA result is negative, start second-line drugs.

- If DR-TB resistant, send sample for DST.
- If DR-TB susceptible, continue normal treatment.

- If LPA result is inconclusive, send sample for culture.
- If LPA result is positive, send sample for DST.
- If LPA result is negative, start second-line drugs.

- If DR-TB resistant, send sample for DST.
- If DR-TB susceptible, continue normal treatment.

- If LPA result is inconclusive, send sample for culture.
- If LPA result is positive, send sample for DST.
- If LPA result is negative, start second-line drugs.

- If DR-TB resistant, send sample for DST.
- If DR-TB susceptible, continue normal treatment.

- If LPA result is inconclusive, send sample for culture.
- If LPA result is positive, send sample for DST.
- If LPA result is negative, start second-line drugs.

- If DR-TB resistant, send sample for DST.
- If DR-TB susceptible, continue normal treatment.
Shorter DRTB Regimen summary (people over 6 years)

4-6 months (Intensive Phase):
LZD (2 months only)–BDQ (total 6 months)*
–hdINH (4-6 months)–LFX–CFZ–PZA–EMB

5 months (Continuation Phase):
LFX–CFZ–PZA–EMB

LZD = linezolid; BDQ = bedaquiline; hdINH = high-dose isoniazid; LFX = levofloxacin; CFZ = clofazimine; PZA = pyrazinamide; EMB = ethambutol.

The dose of linezolid in children weighing less than 16 kg is 15 mg/kg once daily, and for children weighing 16 kg and above, the dose is 10 mg/kg once daily.

Bedaquiline should be given at the adult dose of 400 mg once daily for 14 days followed by 200 mg thrice weekly for people whose weight is greater than 30 kg; for those weighing between 16 kg and 30 kg, a dose of 200 mg once daily for 14 days followed by 100 mg thrice weekly should be administered. There are currently no data to support dosing recommendations for bedaquiline for people weighing less than 15 kg.

<table>
<thead>
<tr>
<th></th>
<th>2 MONTHS</th>
<th>4 MONTHS</th>
<th>6 MONTHS</th>
<th>9 MONTHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linezolid</td>
<td></td>
<td></td>
<td></td>
<td><em>Give for 2 months even if second-line LPA shows injectable and fluoroquinolone susceptibility</em></td>
</tr>
<tr>
<td>High-dose isoniazid</td>
<td></td>
<td></td>
<td>Extend for another 2 months if smear positive at month 4*</td>
<td></td>
</tr>
<tr>
<td>Bedaquiline</td>
<td></td>
<td></td>
<td></td>
<td>Continue to 9 months in some patients</td>
</tr>
<tr>
<td>Levofloxacin</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clofazimine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pyrazinamide</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethambutol</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*If smears remain positive at month 4, begin extended workup for treatment failure while isoniazid is continued.

Switching from Short to Long regimen
Consider this when:
- Fluoroquinolone resistance detected that was not previously detected
- Positive culture result at Month 4 (delayed conversion or regression)
- Bedaquiline, Linezolid, Levofloxacin, Clofazimine prematurely and permanently discontinued because of toxicity
- Patient clinically deteriorating or not clinically improving
When “LTFU” returns to care
- “Welcome back” counselling and additional adherence support: explore substance use, mental health, undisclosed side effects, socio-economics.
- Send sputum for reflex testing and request extended DST.
- Regimen selection to consider patient’s clinical status, extent of disease, bacteriological status at time of LTFU (smear and culture), length of therapy received, length of time between LTFU and return to care.
- In patients who have microbiological / radiological and clinical picture confirming TB disease, start empiric long treatment regimen which awaiting extended DST. Get input from NCAC as needed.
Sample Longer Regimens for People Older than 6 years

<table>
<thead>
<tr>
<th>EXAMPLE</th>
<th>INTENSIVE PHASE</th>
<th>CONTINUATION PHASE</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Basic” longer regimen</td>
<td>6 months of: BDQ–LZD–LFX–CFZ–TRD</td>
<td>12 months of three drugs: LFX–CFZ–TRD (if one of these three drugs are not tolerated, extend either LZD or BDQ instead)</td>
<td>If TRD contra-indicated or not tolerated in intensive phase, then no need to substitute TRD (unless there was previous treatment with second-line drugs, or extensive disease)</td>
</tr>
<tr>
<td>Fluoroquinolone-resistant RR-TB longer regimen</td>
<td>6 months of: BDQ–LZD–DLM–CFZ–TRD</td>
<td>12 months of three to four drugs: CFZ–TRD– [LZD, BDQ and/or DLM, depending on tolerance]</td>
<td>Use four drugs in continuation phase if extensive disease, co-morbidities</td>
</tr>
<tr>
<td>CNS RR-TB longer regimen</td>
<td>12 months of: BDQ–LZD–DLM–LFX–CFZ–TRD–PZA– [high-dose INH 15 mg/kg, or ETO, depending on INH mutation]</td>
<td>6 months of four to five drugs: LFX– CFZ–TRD–PZA– [LZD or high-dose INH 15 mg/kg or ETO depending on INH mutation]</td>
<td>High-dose INH is higher than usual (15 mg/kg) for CNS disease in adults</td>
</tr>
</tbody>
</table>

*Treatment duration is 18 months but could be extended to 20 months per clinician discretion

LZD = linezolid; BDQ = bedaquiline; LFX = levofloxacin; CFZ = clofazimine; TRD = terizidone; DLM = delamanid; PZA = pyrazinamide; INH = isoniazid; ETO = ethionamide

What to do when BDQ is interrupted

- If interruption less than 30 days, re-start BDQ at the three times per week dosing.
- If interruption 30 days or more, then reload with 400mg daily for seven days, followed by 200mg three times a week. (If patient weight between 16 and 30kg then halve these doses.)
Sample Longer Regimens for Children Younger than 6 years

<table>
<thead>
<tr>
<th>DRUG SUSCEPTIBILITY PATTERN</th>
<th>AGE GROUP</th>
<th>SUGGESTED REGIMEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>RR-TB that is NOT fluoroquinolone resistant or central nervous system disease</td>
<td>3-6 years</td>
<td>LFX−LZD−CFZ− TRD–[DLM or PAS]</td>
</tr>
<tr>
<td></td>
<td>0-3 years</td>
<td>LFX−LZD−CFZ−TRD – [PAS or ETO/high-dose INH]</td>
</tr>
<tr>
<td>RR-TB that is resistant to fluoroquinolones</td>
<td>3-6 years</td>
<td>LZD−CFZ−TRD−DLM−[PAS or ETO]</td>
</tr>
<tr>
<td></td>
<td>0-3 years</td>
<td>LZD−CFZ−TRD−DLM* –[PAS and/or ETO/high-dose INH]</td>
</tr>
<tr>
<td>RR-TB central nervous system disease</td>
<td>&lt;6 years</td>
<td>LFX−LZD−TRD−DLM* – [ETO/high-dose INH]−[PZA]</td>
</tr>
</tbody>
</table>

*Benefit of delamanid use likely outweighs risks in these populations and should be strongly considered for use.

LZD = linezolid; LFX = levofloxacin; CFZ = clofazimine; TRD = terizidone; DLM = delamanid; PZA = pyrazinamide; INH = isoniazid; ETO = ethionamide; PAS = para-aminosalicylic acid

Treatment of DR TB in children
- Children exposed to DR-TB who you think may have disease need to be discussed with an expert
- DRTB in children gets treated at Zithulele.

Duration of DRTB treatment in Children
- Duration of treatment for children under the age of 6 years depends on site and severity of disease
  - Non-severe disease: 9 – 12 months
  - Severe disease: 12 – 18 months, depending on clinical progress
- Severe disease defined by WHO as “presence of cavities or bilateral disease on CXR or EPTB other than lymphadenopathy.”
- Advanced malnutrition, advanced immunosuppression or any positive TB bacteriology may also be considered in determining treatment duration.
- No specified intensive or continuation phase – continue all drugs throughout the duration of treatment if possible, unless limited by toxicity or intolerance.
## DRTB Drugs and doses

<table>
<thead>
<tr>
<th>MEDICINE, Tab size &amp; average daily dose</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;33 kg</td>
</tr>
<tr>
<td><strong>BEDAQUILINE 100mg</strong></td>
<td>400mg daily for 2 weeks then 200mg M/W/F</td>
</tr>
<tr>
<td><strong>LINEZOLID 600mg</strong></td>
<td>300mg</td>
</tr>
<tr>
<td>Reduce to 300mg if ADR</td>
<td></td>
</tr>
<tr>
<td><strong>LEVOFLOXACIN 250mg</strong></td>
<td>750mg</td>
</tr>
<tr>
<td>15-20mg/kg daily</td>
<td></td>
</tr>
<tr>
<td><strong>High dose INH 300 mg</strong></td>
<td>By wt.</td>
</tr>
<tr>
<td>15mg/kg daily</td>
<td></td>
</tr>
<tr>
<td><strong>CLOFAZIMINE 100 mg</strong></td>
<td>100mg</td>
</tr>
<tr>
<td><strong>ETHAMBUTOL 400 mg</strong></td>
<td>By wt.</td>
</tr>
<tr>
<td>15-20mg/kg daily</td>
<td></td>
</tr>
<tr>
<td><strong>PYRAZINAMIDE 500 mg</strong></td>
<td>3</td>
</tr>
<tr>
<td>30-40mg/kg daily</td>
<td></td>
</tr>
<tr>
<td><strong>PAS 4g sachet</strong></td>
<td>4g</td>
</tr>
<tr>
<td>200mg/kg</td>
<td></td>
</tr>
<tr>
<td><strong>TERIZIDONE 250mg</strong></td>
<td>By wt.</td>
</tr>
<tr>
<td>15-20mg/kg daily</td>
<td></td>
</tr>
<tr>
<td><strong>KANAMYCIN</strong></td>
<td>By wt.</td>
</tr>
<tr>
<td><strong>MOXIFLOXACIN 400 mg</strong></td>
<td>400mg</td>
</tr>
<tr>
<td><strong>ETHIONAMIDE 250 mg</strong></td>
<td>By wt.</td>
</tr>
<tr>
<td>15-20mg/kg daily</td>
<td></td>
</tr>
</tbody>
</table>

### Paeds dosing

| Clofazamine (100mg capsule) | 2-5mg/kg |
|                            | >20kg 100mg od |
|                            | >10kg 100mg alt days |
|                            | <10kg 100mg every 3rd day |
| Linezolid 100mg/5ml suspension 600mg tab | 5-15kg: 15mg/kg |
|                            | 16-24kg: 12mg/kg |
|                            | >24kg: 10mg/kg |

- Doses need to be adjusted as child gains weight!
- Round doses up to appropriate tablet size.
- Consider using multivit syrup to hide taste
- PAS must be given with acidic food
- Caregiver must be able to administer meds independently before discharge.
ART modification (for people >10 years and >35kg) when RR-TB treatment

<table>
<thead>
<tr>
<th>ART REGIMEN AT RR-TB DIAGNOSIS</th>
<th>PROPOSED ART REGIMEN*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>VL &lt;50 cells/mL</td>
</tr>
<tr>
<td>TDF–FTC–EFV</td>
<td>TDF–3TC–DTG</td>
</tr>
<tr>
<td></td>
<td>(combination known as TLD)</td>
</tr>
<tr>
<td></td>
<td><strong>If DTG not available:</strong></td>
</tr>
<tr>
<td></td>
<td>1. TDF–FTC–LPV/r#</td>
</tr>
<tr>
<td></td>
<td>2. TDF–FTC–NVP (only in women with CD4 nadir &lt;250 and men with CD4 nadir &lt;400)</td>
</tr>
<tr>
<td>ABC–3TC–EFV</td>
<td>ABC–3TC–DTG</td>
</tr>
<tr>
<td></td>
<td><strong>If DTG not available:</strong></td>
</tr>
<tr>
<td></td>
<td>1. ABC–3TC–LPV/r#</td>
</tr>
<tr>
<td></td>
<td>2. ABC–3TC–NVP (only in women with CD4 nadir &lt;250 and men with CD4 nadir &lt;400)</td>
</tr>
<tr>
<td>TDF–3TC–DTG</td>
<td>TDF–3TC–DTG</td>
</tr>
<tr>
<td>TDF–FTC–LPV/r</td>
<td>TDF–FTC–LPV/r#</td>
</tr>
<tr>
<td>ABC–3TC–LPV/r</td>
<td>ABC–3TC–LPV/r#</td>
</tr>
<tr>
<td>AZT–3TC–LPV/r</td>
<td>TDF–FTC–LPV/r#</td>
</tr>
<tr>
<td></td>
<td><em>(ABC can be used if TDF contra-indicated; once linezolid is completed and Hb &gt;10 g/dL, regimen can be changed back to AZT–3TC–LPV/r)</em></td>
</tr>
</tbody>
</table>

*Consult NCAC or other expert for individual ART plan if viral load between 50-1,000.
**In line with updated national HIV guidance, adherence support should be reviewed, viral load should be repeated in 3 months; persistently raised viral load with good adherence should trigger assessment for potential genotyping.
#Consider ATV/r if patient complains of pill burden or gastrointestinal side effects with LPV/r.

VL = viral load; TDF = tenofovir disoproxil fumarate; FTC = emtricitabine; 3TC = lamivudine; ABC = abacavir; EFV = efavirenz; DTG = dolutegravir; LPV/r = lopinavir/ritonavir; ATV/r = atazanavir/ritonavir; NVP = nevirapine; AZT = zidovudine
ART modification (for children <10 years OR <35kg) when RR-TB treatment

<table>
<thead>
<tr>
<th>ART REGIMEN AT RR-TB DIAGNOSIS</th>
<th>PROPOSED ART REGIMEN*</th>
<th>( VL &lt;50 \text{ cells/mL} )</th>
<th>( VL \geq 1,000 \text{ cells/mL}^{**} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children 20-35 kg ABC–3TC–EFV</td>
<td>ABC–3TC–DTG</td>
<td>D4T–3TC–LPV/( r^{#} )</td>
<td>Once linezolid completed and Hb in normal range for age, could be changed to: AZT–3TC–DTG</td>
</tr>
<tr>
<td>If DTG not available:</td>
<td>ABC–3TC–LPV/( r^{#} )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ABC–3TC–LPV/( r^{#} )</td>
<td>Continue ABC–3TC–LPV/( r^{#} )</td>
<td>Once linezolid completed and Hb in normal range for age, could be changed to: AZT–3TC–DTG</td>
<td></td>
</tr>
<tr>
<td>Children 20-35 kg</td>
<td>D4T–3TC–LPV/( r^{#} )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ABC–3TC–LPV/( r^{#} )</td>
<td>Continue ABC–3TC–LPV/( r^{#} )</td>
<td>Once linezolid completed and Hb in normal range for age, could be changed back to: AZT–3TC–LPV/( r^{#} )</td>
<td></td>
</tr>
<tr>
<td>Children &lt;20 kg ABC–3TC–EFV</td>
<td>ABC–3TC–LPV/( r^{#} )</td>
<td>D4T–3TC–LPV/( r^{#} )</td>
<td>Once linezolid completed and Hb in normal range for age, switch D4T to AZT</td>
</tr>
<tr>
<td>Children &lt;20 kg ABC–3TC–LPV/( r^{#} )</td>
<td>Continue ABC–3TC–LPV/( r^{#} )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children &lt;20 kg ABC–3TC–EFV</td>
<td>ABC–3TC–LPV/( r^{#} )</td>
<td>D4T–3TC–LPV/( r^{#} )</td>
<td></td>
</tr>
<tr>
<td>Children &lt;20 kg ABC–3TC–LPV/( r^{#} )</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Consult experienced paediatrician for individual ART plan if viral load between 50-1,000. **In line with updated national HIV guidance, adherence support should be reviewed, viral load should be repeated in 3 months; persistently raised viral load with good adherence should trigger assessment for potential genotyping. \( r^{#} \) Consider ATV/r in children ≥6 years of age and ≥15 kg if LPV/r not tolerated. VL = viral load; 3TC = lamivudine; ABC = abacavir; EFV = efavirenz; DTG = dolutegravir; LPV/r = lopinavir/ritonavir; ATV/r = atazanavir/ritonavir; AZT = zidovudine; D4T = stavudine

**INH Monoresistance Regimen**

INH monoresistance requires 6 months of treatment with RHZE plus Levofoxacin. In this regimen, INH should be dosed at 10mg/kg. Remember pyridoxine.
What happens on a DRTB follow up visit?

The follow up visit should be streamlined and efficient for infection control purposes and for the patient’s sake (some come monthly for up to 2 years!)

- **Admin**
  - Patient to collect file, get stamp and have observations done.
  - Ensure all blood results are up to date and recorded in the DR-TB file!
    - It’s especially important to follow up the initial LPA and ensure the patient is on the correct regimen.
    - Ensure start dates and “target dates” clearly recorded

- **Clinical**
  - Observations and clinical notes get recorded in DR-TB file and referenced in the handheld record
  - Ask how the patient is! Listening to their concerns plays a big role in ensuring long term adherence to drugs with toxic side effects. Ask about nausea, rashes, peripheral neuropathy, pill burden
  - Check weight

- **Sputum monitoring**
  - A new TBMC&S is needed every month.
  - If AFB or culture positive in month four, repeat DRTB reflex and consider phenotypic extended DST

- **Bloods monitoring**
  - FBC and neutrophil count at 2 weeks, 4 weeks, then monthly on LZD
  - If QTcf prolonged: Do Creatinine, Potassium and Magnesium
  - If jaundice, vomiting or abdo discomfort: do LFT
  - Anyone on injectable: monthly Creatinine and Potassium
  - If on Ethionamide or PAS: TSH every three months.
  - ART monitoring bloods as required

- **ECG monitoring** needed monthly while on BDQ. Use Frederica’s QT correction

- **HIV**
  - If negative, recheck at 3 months and 1 year
  - If on ARVs check regimen (see drug interactions above) and VL

- **Pregnancy**: Ask women about pregnancy and contraception

- **Prescribe**
  - Next month’s treatment on the proforma.
  - Remember Bactrim if HIV positive
  - Remember ARVs and any other chronic meds

---

**DR-TB follow up visits (children)**

- At follow up visits, child needs weight, symptom review, CXR every 2-3 months if previously abnormal
- Blood tests as per adults
- Follow up any outstanding blood, sputum or gastric washing results, including checking sensitivity profile of index case if this not known at time of diagnosis
- Complete script on proforma (remember to change doses as weight increases)
### ECGs and BDQ

<table>
<thead>
<tr>
<th>QTcF on ECG at baseline</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;450 ms = normal</td>
<td>Start BDQ/ and repeat ECG after 2 weeks (not eligible for BDQ if baseline QTcF&gt;450ms - consult PCAC)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>QTcF on follow-up ECG done at 2 weeks then monthly</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;450 ms = normal</td>
<td>Cont BDQ with routine QTcF monitoring</td>
</tr>
<tr>
<td>450-469 ms or increase in interval &lt;30 msec</td>
<td>Cont BDQ with routine QTcF monitoring</td>
</tr>
<tr>
<td>= mild prolongation</td>
<td>If no clinical cardiac symptoms (chest pain, palpitations, dizziness and syncope) then continue BDQ and repeat ECG after 1 week. If clinical cardiac symptoms then withhold BDQ and other QT-prolonging drugs and repeat ECG within 1 week</td>
</tr>
<tr>
<td>470-499 ms or increase in interval 30-50 msec</td>
<td>Stop BDQ, LFX &amp; CFZ. Exclude other causes of QT prolongation (drugs, electrolyte disturbances, hypothyroidism) and manage appropriately. Repeat ECG after 48 hours. If QTcF decreasing, monitor <strong>weekly</strong>. When QTcF&lt;470ms, restart, LFX, CFZ &amp; BDQ sequentially, with QTcF monitoring in between.</td>
</tr>
<tr>
<td>= moderate prolongation</td>
<td></td>
</tr>
<tr>
<td>&gt;500 ms or increase in interval &gt;50 msec</td>
<td></td>
</tr>
<tr>
<td>= severe prolongation</td>
<td></td>
</tr>
</tbody>
</table>
Drug Resistant TB exposure

- All people exposed to RR-TB in the household or other high-risk setting need proper evaluation to rule out active RR-TB disease. This includes:
  - Symptom screening
  - CXR
  - Mantoux, in children, if available

- All people exposed to RR-TB who have signs and symptoms of TB need proper investigation:
  - Specimen sampling where possible - genotypic and phenotypic testing
    - GeneXpert and LPA (incl 1st & 2nd line sensitivities)
    - All positive PCRs (Gxp or LPA) must have Culture for DST sent. (In children especially, beware false positives)
  - Admit children to ward, if coughing, for induced sputum or gastric washings (for younger kids)
    - On Day 1 send two specimens, one for GXP, one for TBMCS
    - On Day 2 send one specimen for TBMCS
  - All children with symptoms or concerning CXR must get Co-amoxiclav for five days and be followed up three weeks later with a new CXR.
  - Once the child has been worked up, discuss with Dr Taryn Gaunt, Dr Suretha Cilliers. If they’re away, discuss with Prof Schaaf (at Stellenbosch) or Dr Lochan (Paeds ID at Frere)
  - Please make sure Taryn is aware of ALL cases, even if away when you encounter them – keep a record and inform her.

- If TB treatment deemed appropriate, it should be based on the resistance pattern of the source patient until their own DST results know.

- If there are no signs and symptoms of TB after exposure, the options are:
  - Watchful waiting with close monitoring for two years
    - Children monitored 3-monthly (give TPT if under 6 or HIV positive)
    - Adults monitored 6-monthly
  - RR-TB preventative therapy (decision influenced by smear status of contact, HIV status of person, age)

Drug doses for preventative therapy:
- Isoniazid 10-15mg/kg/d (adult) or 10-20mg/kg/d (child) (100mg tabs)
- Levofoxacin 15-20mg/kg/day (250mg tabs)
- ± Ethambutol 20-25mg/kg/day (400mg tabs)
Non-Communicable Diseases

**Principles**
- As far as is possible, manage patients with chronic conditions at their local clinics
- Make use of repeat scripts (CCMDD for stable patients)
- Ideally, they should see a doctor every six months (preferably at the clinic)
- Remember monitoring bloods

**DKA**
*(what happens when you don’t manage diabetes well!)*

Remember that DKA is a serious condition and should ideally be treated in a high care (even ICU) setting. Careful attention therefore needs to be paid to these patients and complicated cases discussed and transferred as appropriate.

Mnemonic: **RIP IT**

**Step 1 – RESUSCITATION:**
Fluid: 2 x large IV lines followed by
1L N/S stat then
1L N/S over 1 hr then
1L N/S over 2 hrs then
1L N/S over 4 hrs then
1L N/S over 6hrly

Bloods: U&E, FBC and blood gas (if available)
Urine catheter and output monitoring
**NB** Look for sepsis and treat early as this may be a precipitant

**Step 2 - INSULIN:**
Only give insulin once 1st L N/S given and systolic BP above 90.
Give through a separate line to the resuscitation fluids
- Give 10 units actrapid IV stat then
- Put 200 units actrapid in 200 mls N/S and run through twice the volume of the giving set (insulin binds to plastic avidly)
- Run a **constant** infusion of 0.1 unit/kg/hr and no more than 6 mls/hr.
- If there is no infusion pump available, insulin can be given as subcutaneous boluses (0.1 unit/kg) every hour.

**Step 3 – POTASSIUM:**
Potassium needs to be supplemented after stat fluid has been given and insulin infusion commenced.
- To keep it simple, add 20 mmol KCL to every 1L fluid running over 4-6 hrs
Step 4 – INTENSIVE MONITORING:
- Hourly HGT monitoring
- **NB:** Change fluids to 5% dextrose once HGT drops below 15mmol/l
- **Stop insulin** if HGT < 5 mmol/l, give 20 mls 50% dextrose and call the doctor.
  - Doctor to then restart insulin and reduce rate by 1 ml/hr
- Vitals at least 4 hourly, including urine output
- Monitor GCS. NB drop in GCS may = cerebral oedema. Discuss with senior.
- Daily Urine dipstix, U&E and blood gas (when available) or lab bicarb.

Stop IV insulin once ketonuria cleared, HGT improved (<11.1) and patient clinically feeling better. A HCO₃ above 18 on U&E or gas is usually a good marker of improved acid base balance. (Venous pH >7.3 if gas available)

Note: If the patient is not improving, look actively for a source of infection: Do UMC&S, WCC, CXR and a PV (for PID in women), and start empiric Ceftriaxone.

Step 5: TEACHING AND OPTIMIZING
Once IV insulin has been stopped, subcutaneous insulin can be given, according to a sliding scale, to determine the daily insulin requirements, before a biphasic or basal bolus regimen is started.

Although patients appear much better, this is an equally important phase of the management. Patients need to be educated about their condition and advised on their diet. They also need to be taught to inject themselves and empowered. The dieticians play an important role in this stage of management so refer early.

**Diabetes**

**Purpose**
It is really worth trying optimise care of patients with diabetes, including ensuring optimal control of blood glucose levels, so as to decrease the complications and disability associated with poor control!

Involving the dietician in the management of all diabetic patients – many will be followed up at the clinic by the dietician, but all need dietary advice!

**Targets**
- **Medical**
  - BP <130/80mmHg
  - Blood lipids: LDL<100mg/dl and Triglycerides<150mg/dl
  - Random blood glucose <11.1mmol/l
  - HbA₁c < 7.0% (within 1% of upper limit of normal)
- **Regular medical screening**
  - Early detection of microalbuminuria and nephropathy
  - Good self-care of feet
  - Annual screening for retinopathy
  - Targeted screening for depression
  - Regular dental check-up
- **Lifestyle issues**
  - Cessation of smoking
Non-Communicable Diseases – Diabetes 152

- Nutritional advice regarding appropriate diet
- Promotion of regular exercise (ideally, individualised)
- Assistance with weight loss where necessary

**Ideally, every patient needs**

<table>
<thead>
<tr>
<th>Every visit</th>
<th>Every four months</th>
<th>Every year</th>
</tr>
</thead>
<tbody>
<tr>
<td>• BP documented</td>
<td>• BP</td>
<td>In addition to regular checks:</td>
</tr>
<tr>
<td>• HGT if possible</td>
<td>• HGT (finger prick)</td>
<td>• Fasting lipids (blood test)</td>
</tr>
<tr>
<td>• Weight documented</td>
<td>• HbA1c (blood test)*</td>
<td>• Albumin/Creatinine ratio (urine test)**</td>
</tr>
<tr>
<td></td>
<td>• Eye screening questions</td>
<td>• Full foot exam (pulses, sensation, inspection)</td>
</tr>
<tr>
<td></td>
<td>• Foot check (visual)</td>
<td>• Fundus photograph</td>
</tr>
<tr>
<td></td>
<td>• Nutrition advice</td>
<td>• Dental examination</td>
</tr>
<tr>
<td></td>
<td>• Smoking advice</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Depression screen</td>
<td></td>
</tr>
</tbody>
</table>

* can be done less frequently once well controlled
** not needed if proteinuria documented. Normal ratio is <3.

**Drug treatment (type 2 diabetes)**

- **Hypoglycaemics**
  - Step wise approach:
    - **Metformin** is first line treatment in most patients (esp if overweight)
      - Start with 500mg BD. (Use 500mg daily if pre-diabetic).
      - Maximum dose 850mg tds (1g BD often more practical)
      - Take care if renal function impaired. C/I if GFR<30
    - **Add sulphonylurea**
      - Usually glimepiride. Start at 1mg daily, titrate to max 8mg dly
      - Alt = glibenclamide (2.5mg dly → 5mg dly → bd → 7.5mg bd)
    - **Replace sulphonylurea with insulin** (continue Metformin)
      - In some patients, adding long-acting insulin (Humulin N aka Protophane) at night is sufficient. Start with 8u. Increase by 2u per dose every three days until target glucose. Max 20-30u
      - Others will require admission to start intermediate-acting insulin (Humulin 30/70 aka Actraphane). Start with 15u per day (0.3u/kg/d if under 50kg) given 2/3rd before breakfast and 1/3rd before supper
  - **Hypertension**
    - Use three or even four drugs if necessary to achieve target
      - ACE-inhibitor (enalapril 5mg dly → bd → 10mg bd → 20mg bd)
      - Thiazide (HCTZ 12.5mg dly)
      - Calcium channel blocker (Amlodipine 5mg → 7.5mg → 10mg dly)
- **Simvastatin**
  - When lifestyle and nutritional interventions fail to reduce lipid levels below target levels. Some recommend for all patients over 40 years.
  - Starting dose: 10mg dly. Maximum 80mg/d (ideally <40mg/d)
  - Simvastatin is contraindicated in patients on HAART
• Aspirin
  o 150mg dly only for secondary prophylaxis of cardiovascular complications (evidence suggests aspirin does not contribute much as primary prophylaxis)
• Microalbuminuria (or proteinuria)
  o All patients should be on an ACE inhibitor

A note on sliding scales
To keep things simple, we use two main sliding scales. (The proforma has both – choose one.) HGT should be checked every four hours
1. In a patient not yet on meds where you want tight control and an accurate estimate of insulin requirement, use the sliding scale with 2u increments.
   • The corollary is that before starting a biphasic regimen you should use a sliding scale to estimate your start point!
2. When a patient is on medication and you want to get an idea of usual control while preventing excessive hyperglycaemia tailor the sliding scale to give 5u when HGT above 12mmol/l, 10u if above 17mmol/l and 15u if above 22mmol/l.

Types of insulin
The various types of insulin can be confusing. Do not assume that the nurse dispensing the medication to the patient will know what you mean. Take the time to ensure understanding.

<table>
<thead>
<tr>
<th>Colour on box</th>
<th>Duration of action</th>
<th>Generic name</th>
<th>Trade names</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow</td>
<td>Short acting</td>
<td>Regular insulin</td>
<td>Actrapid</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Humulin R</td>
</tr>
<tr>
<td>Brown</td>
<td>Intermediate</td>
<td>Mixed 30% regular w 70% isophane</td>
<td>Actraphane</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Humulin 30/70</td>
</tr>
<tr>
<td>Green</td>
<td>Long-acting</td>
<td>Isophane (NPH) insulin</td>
<td>Protaphane</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Humulin N</td>
</tr>
</tbody>
</table>

TB Preventative Therapy
Having diabetes is a high risk state. Use the algorithm in the TB section to choose how to protect your diabetic patient from TB disease.
**Status Epilepticus**

Anyone who has a seizure lasting >5 minutes or more than one seizure without regaining consciousness in between...

These steps can be undertaken simultaneously

**AIRWAY**
Secure the airway. Give oxygen.
Note: If you use suxamethonium for a RSI it may mask the seizures.

**BENZOs**
Give (in order of preference):
- Lorazepam IV/IM 4mg OR
- Diazepam IV 10mg OR
- Midazolam IM/IV 10mg
- Midazolam buccal 10mg (IV formulation) [Use 5mg if weight 13-40kg]

If seizures continue, repeat after 5-10 minutes
Theoretically, there is no absolute maximum dose of lorazepam, but care needs to be taken to avoid undiagnosed respiratory depression or BP drop.

**LOADING**
All patients need loading with a non-benzodiazepine even if seizures have stopped. Use Sodium Valproate 20-40mg/kg over 5 minutes

If you are 100% sure the patient is HIV negative, you may use
Phenytoin IV 18mg/kg in 200ml 0,9% saline over 30 minutes OR
Phenobarbitone IV 20mg/kg
And then re-load with the other if still fitting.
(Phenytoin and Phenobarbitone reduce serum levels of ART and even a single dose may induce resistance)

**REFRACTORY STATUS**
If fits continue despite the above measures, consider:
Midazolam infusion (0.05-0.2mg/kg/hr)
Propofol infusion (not more than 5mg/kg/hr)
Patient will require intubation.
Consider other neuroprotective measures (nursing position, mannitol etc)

**REVERSIBLE CAUSES**
- Check glucose levels immediately
- Take blood to exclude hyponatraemia, uraemia, anti-convulsant levels
- Consider poisoning (e.g. INH, theophylline, TCAs)
Epilepsy

Where to start?
1. Remember, in the absence of danger signs, everybody is allowed one fit!
2. Spend some time getting a good and proper history and make sure this really is epilepsy (exclude vaso-vagal episodes etc.).
3. Classify the type of epilepsy.
4. Use MONOTHERAPY if at all possible (and convert to monotherapy all patients on two or more drugs unless started on more than one drug after proper work up, monitoring & preferably consultation with a senior)

What about Neurocysticercosis?
A large majority of adults and older children with new onset seizures (in the absence of other danger signs) are likely to have neurocysticercosis. Our evidence-based approach is not to treat empirically with anti-parasitic therapy. This is based on:
1. We cannot obtain neuroimaging for all our patients. Treating without CT scan is contraindicated as certain manifestations have worse outcomes. An NCC Elisa may be worthwhile depending on the differential but won’t guide Rx
2. Although evidence suggests GTC seizures may be reduced by anti-helminthic treatment, the no. of seizures and no. of pts having seizures was the same
Treating proven solitary cysts with Albendazole 400mg BD for 10 days is probably worthwhile. It is prudent to cover with oral prednisone and admission for the first days may be the safest approach.

Definition of control
Ideally – patient should have no seizures at all. Increase the dose in all adherent patients with more than 1 seizure a month, unless poor baseline and/or toxicity from drugs

Which drug should you use?
- HIV negative patients
  - carbamazepine – it has more predictable metabolism and pharmacokinetics than phenytoin and is the drug of choice for partial seizures or partial complex seizures (which is by far the commonest form of epilepsy at ZLE)
- HIV positive patients
  - sodium valproate – drug interactions with ARVs make other drugs, except lamotrigine, contraindicated
  - lamotrigine – remember to boost dose if patient on a PI (r/lpv or atz)
- Post head injury
  - IV phenytoin acutely post injury may offer benefit
  - PO phenytoin used as prophylaxis should be guided by the neurosurgeons, but long term use should be rare and post-traumatic epilepsy treated with alternative drugs.
• Pregnancy
  • Lamotrigine is first choice. You may need to make a prudent choice midway through a pregnancy, when switching can be challenging, depending on control. Discuss with a senior.
• Patients who are on Phenytoin already and are well controlled should not be changed, but ask about side effects and consider doing blood levels if any signs of toxicity (see boxes below).
• Phenobarbitone is a great drug in neonates, but **should not be used in children or adults due to significant side effects!** Change all patients on phenobarbitone to carbamazepine
• Renal or hepatic failure.
  • Use lower doses as per SAMF
  • Sodium Valproate should not be used in pre-existing liver failure.

**Carbamazepine**
• Start with 200mg BD, review 2 weekly increasing the dose by 100mg every 2 weeks depending on response.
• Minimum effective dose is usually 300mg BD to 600mg BD, usual max dose is 600mg BD

**Sodium Valproate**
• Start on 300mg BD, increase by 100mg BD every 2 weeks until controlled.
• Usual effective dose is 500mg BD to 1000mg BD, max dose is 1200mg BD
• Avoid in pregnancy
• Do **not** do drug levels for patients on valproate.

**Lamotrigine**
• If not on any anti-epileptic, start with 25mg daily for two weeks, then increase to 50mg daily for two weeks, then by 50mg per week until controlled
• Usual effective dose 225-375mg daily
• A different tapering strategy is necessary when switching from or adding to valproate and yet another for other anti-epileptic drugs. Look these up.
• Needs boosting if used in PI based ART regimens

**Blood levels**
*(Ideally, blood levels should be taken just before the morning dose of medication (tell patients to come back in three weeks [early in the morning] and write it clearly in the notes)*

Indications for blood levels:
1. Suspected non-compliance
2. Suspected toxicity (take immediately)
3. Poor control despite self-reported good adherence (this does not apply to patients on valproate)

How to interpret blood levels:
1. 0 or very low – likely non-compliance
2. Above therapeutic levels – likely some toxicity
3. Just below therapeutic levels – patient probably compliant, but requiring higher doses
4. Therapeutic levels but still significant numbers of seizures – change the drug
5. Therapeutic levels and control – yippeee! (But you probably shouldn’t have taken the level in the first place!)

**Whose medication can be stopped?**
Anyone who has not had a fit for 2 years or more. Discuss the advantages and disadvantages with the patient. Wean them over a few months.

**Who to refer to a specialist neuro clinic:**
1. Patients who continue to fit regularly, even if on adequate and therapeutic doses of Sodium Valproate
2. Epilepsy with unexplained neurological symptoms or signs
3. Any signs of intracranial lesions or focal signs requiring CT scanning
4. Patients who have been treated for status epilepticus

**Book to return in 6 months**
(write down the actual date patient must go to clinic or hospital)
- Patients who are on adequate doses of anti-epileptics with acceptable control
  AND
- Have had bloods done (FBC, U+E and LFT’s) and checked recently AND
- Are able to get their medication from their nearby clinic

**Education is extremely important**
- Importance of compliance
- Importance of avoiding alcohol – can precipitate seizures
- If no fit for 2 years, can **STOP** taking treatment on the advice of a doctor
- Cannot drive a vehicle for at least 2 years after last fit
- Filling in a seizure diary is extremely useful (attach paper to file!)
- No need for coming to hospital after every seizure – rather write it in the book!
- If seizures don’t stop after 10 minutes, come to hospital a.s.a.p.
- Epilepsy does not qualify you for a DG except in very rare circumstances and non-compliance automatically disqualifies a DG application (please check levels!)
- Women: remember (!):
  a) higher doses of oral contraceptives (only OVRAL) or shorter gaps between injections are required! (Depo-provera 8wks, Nur-isterate 6 wks)
  b) speak to the doctor first before trying to fall pregnant (folate supplementation)
- Educate re common side effects of the drug they’re on
Hypertension

Standard Protocol
Use unless a COMPELLING INDICATION is present.
Consider combination therapy from the outset if BP > 160/100 mmHg.
Remember, 60-80% of people with Hpt will require two agents for optimal control.
If target BP not reached after 1 month, go to next step:

Drug 1  HCTZ (most effective monotherapy, and cheap) 12.5mg daily
Drug 2  Amlodipine (may be better than ACEI in black patients) 5mg → 10mg/d
Drug 3  Enalapril 5mg daily → 5mg bd → 10mg bd
Drug 4  Spironolactone 25-50mg daily
Drug 5  Atenolol (as per EDL, but less effective in Africa, avoid in DM) 50mg od
Drug 6  Hydralazine 25mg → 50mg, but also consider adherence, other causes and referral

Compelling Indications
If one of the following conditions exists (a “compelling indication”) ignore the above and use the drugs indicated next to each condition:

<table>
<thead>
<tr>
<th>Compelling indication</th>
<th>Use this</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angina</td>
<td>Atenolol OR Amlodipine</td>
</tr>
<tr>
<td>Previous MI</td>
<td>Atenolol AND Enalapril</td>
</tr>
<tr>
<td>Heart failure</td>
<td>Enalapril* AND Carvedilol AND</td>
</tr>
<tr>
<td></td>
<td>Spironolactone AND Furosemide</td>
</tr>
<tr>
<td>LV hypertrophy</td>
<td>Enalapril*</td>
</tr>
<tr>
<td>Stroke</td>
<td>HCTZ AND Enalapril</td>
</tr>
<tr>
<td>Diabetes</td>
<td>Enalapril* AND usually a diuretic</td>
</tr>
<tr>
<td>Chronic Kidney Disease</td>
<td>Enalapril* AND Furosemide**</td>
</tr>
</tbody>
</table>

* Start at 2.5mg daily in CCF  ** Up to max dose 250mg / day

Don’t forget lifestyle modification
- Smoking cessation
- Moderate alcohol consumption
- Weight management
- Regular moderate aerobic exercise
- A “prudent eating plan” (anyone for Banting?)

Goals
- Blood pressure (mmHg)
  - < 140/90
  - < 130/80 for diabetes, kidney disease & heart failure
- BMI < 25
- Waist circumference
  - < 102cm (men)
  - < 88cm (women)
Important investigations in Hypertension

1. Urine dipstix
   a. If normal repeat every 6 months
   b. If proteinuria do urine protein:creatinine ratio (and monitor annually)
   c. If glycosuria do HGT
   d. If haematuria > 1+ treat for bilharzia (in endemic areas) +
      investigate further

2. HBA1c
   a. If HGT > 7 mmol/L (fasting) or > 11 mmol/L (random)
   b. If known diabetic

3. ECG
   Abnormalities to look for…
   a. Left Ventricular Hypertrophy: (S-wave depth in V1) + (R-wave height
      in V6) = >35 mm
   b. Ischaemia: ST depression or T-wave inversion in lead I,II or V4-6

4. Random total cholesterol

5. Renal function
   a. Creatinine and eGFR (using MDRD formula)

Reminder re secondary hypertension
This list is intended as an aide-memoire for some of the more (or less) common of
secondary hypertension – especially important if onset <30 years.
• Renal artery stenosis
• Glomerular disease (nephritis)
• Polycystic kidneys
• Hyperthyroidism (or hypothyroidism, sometimes)
• Hyperparathyroidism
• Cushing’s syndrome (pituitary disease, or exogenous steroids)
• Aldosteronism (Conn’s)
• Coarctation of the aorta
• Sleep apnoea
Autoimmune diseases

Introduction
Many (most?) doctors feel a bit intimidated by the auto-immune diseases. This guide isn’t intended to unravel your confusion, but rather as a simple guide to your approach.

Rheumatoid Arthritis
Typical history of painful wrists and hands with morning stiffness.

Diagnosis
1. Inflammatory arthritis involving three or more joints
2. Positive Rheumatoid factor or anti-CCP
3. Elevated CRP or ESR
4. At least six weeks duration
Or use ACR/EULAR 2010 Rheumatoid arthritis score on www.MDCalc.com

If RF/anti-CCP negative, consider doing ANA to screen for SLE

On suspicion of RA
1. Start paracetamol, NSAID
2. If there is a high index of suspicion start prednisone 20mg daily
3. Do RF, anti-CCP, CRP, ESR, FBC, ALT and Creat
4. Baseline x-rays of all affected joints
5. Bring back in 2 weeks for results

Once the diagnosis is made
1. Start prednisone 20mg (up to 40mg) daily for two weeks then taper
2. NSAIDS maximally tolerated dose for two weeks (add a PPI if available)
3. Initiate methotrexate at 7.5mg weekly + folic acid 5mg daily
4. Suggest contraception
5. OT referral

Subsequent visits
1. Stop prednisone as soon as possible
2. INCREASE Methotrexate by 2.5mg each month until controlled or 25mg weekly dose
3. FBC, ALT and Creat every 3 months
4. CRP/ESR every 6 months to assess disease activity
5. If symptomatic on max dose mtx or side effect on mtx, start sulfasalazine 500mg bd
Autoimmune screening
Autoimmune diseases should be suspected in patients presenting with:
1. Inflammatory joint pain with negative RF/Anti-CCP
2. Reynaud’s phenomenon
3. Malar rash
4. Pericarditis
5. Hepatitis with negative viral screen and no hepatotoxic drug exposure
6. Young stroke
7. Renal failure with no precipitant like dehydration or nephrotoxic drug exposure

Do not request a full autoimmune from the start
• Do an ANA to screen
  o If the ANA is negative, consider alternative diagnoses
  o If the ANA is positive, do dsDNA, RNP, Sm and Sm/RNP and bring back in 1 month for results. These patients all need discussion with rheumatologist.
• Any positive test would confirm an SLE or mixed connective tissue disease; negative tests would prompt Anti-Ro/SSA, Anti-La/SSB and Jo-1, however, should only be done if requested by specialist)

Erectile dysfunction
Often not the initial presenting complaint, don’t be shy to ask in at risk patients

Cause
First establish if:
1. Psychogenic – young, no medication or chronic illness, sudden onset, situational less common
OR
2. Organic – older, chronic illness (DM, Hpt), multiple medications, gradual onset, global, very common

Management
Psychogenic requires reassurance and counselling

Organic requires:
1. Drug side effects
   If feasible attempt changing common drugs known to cause ED (spironolactone, SSRI’s, B-Blockers, enalapril, digoxin)
2. Neurogenic
   Older diabetic & hypertensive patients, if no obvious drug cause or drug change not feasible, offer private script for sildenafil 50mg prn and refer OT. No further workup is required. May benefit from penile pump (via OT)
3. For patients not fitting into 1) or 2) above think about:
   a. Hypogonadism – screen with testosterone level
   b. Hyperprolactinaemia – screen with prolactin level
Psychiatry

It is not uncommon that one encounters patients as “known psych” in OPD. This label is problematic as it obscures the diagnosis, reduces the chance of optimal treatment and is stigmatising. Please make an effort to make a proper diagnosis or refer to the Psychiatry Classification Clinic if you are unsure.

Brief Psychiatric Assessment

1. History (Patient + collateral)
   a. Primary presenting problem (Nature, onset, duration, severity, associated features)
   b. Symptomatic Enquiry
      i. Mood (sad, low, tearful, happy, excited, irritable, angry, shameful, guilty…)
      ii. Sleeping, eating, energy levels
      iii. Social and occupational functioning
      iv. Thoughts: preoccupations, delusions, special powers, ideas of reference
      v. Perceptions: hallucinations, derealisation, dissociation
      vi. Memory & intellect
      vii. Insight
      viii. Suicidality
   c. Past Psychiatric History
      i. Previous symptoms; diagnoses; medication use and efficacy; psychotherapies/ counselling; other types of therapy; admissions
   d. Past Medical History
      i. Illnesses, medications, surgeries, admissions, investigations
      ii. Trauma: TBIs
      iii. Infections: HIV, TB, Toxo, Syphilis, Encephalitis, Meningitis, Delirium
      iv. Other Neurological: Dementia, CVA, Epilepsy, MS
      v. Toxins: drug use/ withdrawal; encephalopathy (liver/ renal)
      vi. Nutritional: B1, B6, B12
      vii. Immunological: SLE
      viii. Inherited/ Genetic/ Developmental: CP, Syndromes
      ix. Substances
   e. Personal & Family History
      i. Birth, early childhood, schoolyears, teenage, young adult…
      ii. Relationships (family, friends, significant others), personality, skills & resources, challenges and setbacks, traumas and coping, major life events and transitions; worldview
      iii. Family history of psychiatric disease/ symptoms/ suicide etc
      iv. Social & Occupational functioning: HLOE, employment/ occupation, hobbies & activities, involvement in community, forensic history
2. **Examination**
   a. **Brief Mental State Exam (MSE)**
      i. General appearance
      ii. Behaviour
      iii. Mood & Affect
      iv. Speech
      v. Thoughts & Perceptions: delusions, preoccupations, hallucinations, ideas of reference,
      vi. Insight & Judgement
      vii. Cognitive functioning
   b. **Physical exam**
      i. Vitals, LOC, brief systemic exam (? Neurological features, infections, endocrine/ genetic disorders, immunological/ multi system disorders, signs of substance use)
      ii. Signs of trauma/ abuse

3. **Investigations**
   a. To exclude GMCs; substances;
   b. To determine medication adherence
   c. Baseline bloods for medication use: FBC, CUE, sometimes LFT

4. **Management**
   a. Bio (medication – *appropriate medication, at the correct dose, with correct monitoring and follow up*; physical therapies)
   b. Psycho (Counselling, CBT, psychoeducation)
   c. Social (Family, peers, community, CDWs and depression groups)
   d. Spiritual (personal worldview, faith groups/ traditional healers)
   e. MDT (Doctor, nurse, OT, other therapy, CDWs, psychiatrist)
   f. Intersectoral (police, justice, Labour)
   g. MHCA NB. At risk of harm to self or others
   h. Appropriate referral
   i. Appropriate use of DG – NB a doctor has to make the diagnosis! Not a therapist.
Aggressive and Disruptive Behaviour

Approach to Management

1. **Prevention & General Safety Measures**
   Be vigilant; don’t be alone; security to check patients for weapons

2. **Talk-down vs Take-down**
   WHERE POSSIBLE:
   - *Establish rapport:* Introduce yourself and assure the patient that you will try to resolve the cause of their distress "I want to see what is troubling you so that I can help you"
   - *Restate* the problem as you understand it, and ask any clarifying questions in an empathetic, non-judgemental way
   - Ask about *pain, hunger, thirst* --- supply analgesia, food, water as far as possible

   IF NOT POSSIBLE:
   - Assess *hazards*
   - Call for *help*
   - In a calm but authoritative manner ask the patient to sit down.
   - If patient non-compliant - 6 people approach with 5 pillows - 1 person for each limb; one for the head; one to sedate. **Immobilize and sedate**

3. **Sedation:**
   **Oral** if patient amenable: Lorazepam 4mg/ Diazepam 10mg/ Midazolam 15mg buccal

   **Parenteral**
   a.) *Benzodiazepine:*
      - **IV** if possible: Diazepam 10mg (Valium)/ Clonazepam 1mg (Rivotril)
      - **IM** if necessary: Lorazepam 4mg (Ativan)/ Midazolam 15mg (Dormicum)/ Clonazepam 2mg

   **PLUS**
   b.) *Antipsychotic:*
      - Clozapine 20-80mg IM (can repeat 6-8hrly - max 160mg in 24h)
      - Chlorpromazine 25-50mg deep IM
      - Zuclopenthixol acetate 50 – 100mg IM (Clopixol) (If known SCZ on antipsychotics)

   - **NB:** *avoid diazepam IMI* as it has variable absorption
   - **NB:** *do not use IM Lorazepam if on Clozapine,* can cause acute respiratory arrest
   - In general, if the patient remains combative, you don’t need to worry about respiratory depression and can give more. **But** monitor closely once they calm down!
4. **Brief History; Examination**
   NB collateral, MSE, Physical exam, vitals, Level of consciousness

5. **Investigations:**
   urine substances, medication levels, infections, baseline bloods for meds

6. **Further Management:**
   admission, chemical restraints, MHCA, Psych referral, Biopsychosocial, MDT, Inter-sectoral etc

---

**Depression**

**Diagnosis:**
Major depressive episode (note there are actually more than 20 symptoms described in these 9 first criteria)

A. Five (or more) of the following symptoms have been present during the same two-week period and represent a change from previous functioning; at least one of the symptoms is either (1) or (2).
   1. Depressed mood most of the day, nearly every day
   2. Markedly diminished interest or pleasure in all, or almost all, activities most of the day
   3. Significant weight loss when not dieting or weight gain or decrease or increase in appetite nearly every day
   4. Insomnia or hypersomnia nearly every day
   5. Psychomotor agitation or retardation nearly every day (observable by others)
   6. Fatigue or loss of energy nearly every day
   7. Feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day
   8. Diminished ability to think or concentrate, or indecisiveness
   9. Recurrent thoughts of death, recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide

B. The symptoms do not meet criteria for a mixed episode
C. The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning
D. The symptoms are not due to the direct physiological effects of a substance or a general medical condition
E. The symptoms are not better accounted for by bereavement, i.e., after the loss of a loved one, the symptoms persist for longer than two months or are characterised by marked functional impairment, morbid preoccupation with worthlessness, suicidal ideation, psychotic symptoms, or psychomotor retardation

For accurate assessment of severity and monitoring of treatment response – use the PHQ-9 or HAM-D scoring systems
**Treatment**
Consider: **bio** (medication, ECT) **psycho** (counseling, CBT, depression groups) **social** (family, peer/community involvement & groups) **spiritual** (enquire about existential ideation, personal beliefs, faith groups)

**Medication**
On diagnosis start treatment (Drug classes available to us at present):
- **First line:** SSRI: Fluoxetine or Citalopram 20mg PO daily
- **Alternatives:** TCAs: Amitriptylline in EFFECTIVE DOSES 75-100mg note ▪ Start at 25mg nocte and increase every 3-4days
- **When switching between antidepressants** consult this table to ensure safety: http://wiki.psychiatrienet.nl/index.php/SwitchAntidepressants

Review the patient at 2-4 weeks
- 50% of patients will have remission of symptoms – continue treatment, review in one month and then 3 monthly
- 35% will have only a poor improvement – double the dose & r/v in 2 wks
- 15% will have no improvement – switch drug classes

How long to treat for?
- **First episode:** Treat for 1 year from the time of remission of symptoms; but if the episode of MDD lasted more than six months to one year add another year of treatment
- **Second episode:** treat for two years from the remission of symptoms but if the episode lasted more than 6 months consider extended/ lifelong treatment
- **Third episode:** lifelong treatment

**NB** Untreated depression causes cognitive decline and atrophy of the hippocampus (memory area) and is the single proven causative factor in dementia

---

**Anxiety**

**Diagnosis:**
The latest DSM recognizes the following diagnoses of anxiety disorders:

1. **General Anxiety Disorder**
2. Separation Anxiety Disorder
3. Selective Mutism
4. Specific Phobia
5. Social Anxiety Disorder
6. **Panic Disorder**
7. Agoraphobia: fear of being in places/ situations in which escape might be difficult
8. Substance/ medication induced anxiety disorder
9. Anxiety disorder due to a GMC
10. Unspecified anxiety disorder (includes culture-specific conceptions of anxiety)
Trauma and stress-related disorders have been given their own category which include: PTSD, Acute Stress Disorder. Obsessive and Compulsive Related Disorders (OCDRs) have also been given their own category. They include: OCD, Body Dysmorphic Disorder, Hoarding Disorder, Trichotillomania etc.

**Generalized Anxiety Disorder**

Diagnosis: *Excessive and inappropriate worrying; persistent* (more than a few months) and *not restricted to particular circumstances*. *Physical anxiety symptoms and key psychological symptoms* (restlessness, fatigue, difficulty concentrating, irritability, muscle tension, disturbed sleep). Often co-morbid with MDD, Panic Disorder, Phobias, OCD, ADHD. *Often present with physical symptoms: headaches, muscle tension, tiredness, “waist ache”*

**Panic Disorder**

Diagnosis: *Recurrent unexpected surges of severe anxiety (panic attacks)* with *anticipatory anxiety* between attacks. *Panic attacks* are *discrete periods of intense fear/ discomfort, accompanied by multiple physical and psychological anxiety symptoms*. Typically reach their peak in 10mins and last 30-45 mins.

**Management**

Medication:
- considerations for starting treatment – duration and severity of symptoms; social and occupational functioning
- Antidepressants: SSRIs are best in GAD, Panic Disorder
- TCAs can be used but beware suicide risk and avoid in panic disorder
- Pregabalin, Sertraline (best in breastfeeding), Trazadone, Valdoxone not available
- Buspirone, Hydroxyzine, Propranolol useful in acute anxiety
- Benzodiazepines also useful, use ones with longer half-life, beware dependence and addiction
- Severe/ treatment resistant anxiety disorders may benefit from atypical antipsychotics (Quetiapine)

Psychotherapy
- Psychoeducation (Anxiety is a defective coping mechanism; pattern of fear and avoidance; that may be brought about by very real stressors)
- Basic CBT:
  - Trying to get patients to identify and understand: What is wrong in your body? Thought processes… Emotions… Behaviour… Which situations contribute?
    - Breathing: Hand on your belly, hand on your chest “breathe in 1, 2; out 3,4” and repeat. Diaphragmatic breathing stimulates the parasympathetic ganglia located between the diaphragm and spinal vertebrae.
    - Appropriate referral to other therapists
Note on Stressful incidents and PTSD
Benzodiazepines should be avoided in the acute interim as they inhibit formation of healthy coping mechanisms and can worsen the outcome. Psychotherapy should also be avoided in the acute interim as this frequently leads to re-traumatisation. It is very important to acknowledge feelings but focus on the positives and patient’s resources e.g. “I am so glad you are still alive… I am so glad you have your sister to help you…” Avoid over-sympathizing “Oh that’s so awful… I’m so sorry” but try to be empathetic “I am sorry this happened to you, I understand it must be difficult for you”.

PTSD
- SSRIs are indicated and may help:
  - Citalopram/ Fluoxetine 20mg po daily. Review in 2-4 weeks; if no response increase to 40mg.
- If treatment resistant or symptoms persist refer to Psychiatry AND Psychology.

Schizophrenia & Psychoses

Diagnosis:

Schizophrenia
A. Characteristic symptoms: two or more of the following, each present for a significant portion of time during a one-month period (or less, if successfully treated)
   1. delusions
   2. hallucinations
   3. disorganised speech (e.g. frequent derailment or incoherence; speaking in abstracts). See thought disorder
   4. grossly disorganised behaviour (e.g. dressing inappropriately crying frequently) or catatonic behaviour
   5. negative symptoms, i.e. affective flattening (lack or decline in emotional response), alogia (lack or decline in speech), or avolition (lack or decline in motivation

Note: only one of the symptoms is required if delusions are bizarre or hallucinations consist of hearing one voice participating in a running commentary of the patient’s actions or of hearing two or more voices conversing with each other
B. Social/occupational dysfunction: for a significant portion of the time since the onset of the disturbance, one or more major areas of functioning such as work, interpersonal relations, or self-care, are markedly below the level achieved prior to the onset
C. Duration: continuous signs of the disturbance persist for at least six months. This six-month period must include at least one month of symptoms (or less if successfully treated).
D. Schizoaffective and mood disorder exclusion - if present, duration is very brief
E. Substance and GMC exclusion
F. Relationship to pervasive development disorder
**Brief psychotic disorder**
A. Presence of one or more of the following:
   1. delusions
   2. hallucinations
   3. disorganised speech
   4. disorganised or catatonic behaviour
B. **Duration:** one day to one month. Eventual full return to premorbid function
C. Not related to schizophrenia, schizoaffective disorder, mood disorder, substance use or GMC

**Schizophreniform disorder**
A. Criteria A, D and E of schizophrenia are met
B. Episode lasts *one month to 6 months (provisional or not)*
   a. without good prognostic features
   b. with *good prognostic features (two or more)*
      1. absence of blunted or flat affect
      2. good to premorbid features
      3. confusion on perplexity at the height of episode
   * onset of psychotic symptoms within four weeks (behaviour or functioning)

**Schizoaffective disorder**
A. An uninterrupted period of illness with MDE, manic episode or mixed episode with criteria A for schizophrenia
B. Delusions or hallucinations for 2 weeks without prominent mood symptoms
C. **Criteria for a mood episode are present, during the active and residual phase of the illness**
D. Not due to the effects of substance or GMC

**Substance induced psychotic disorder**
A. Prominent hallucinations or delusions (do not include if the patient has insight)
B. History, examination or laboratory finding
   1. symptoms in criteria A developed *during or within a month of intoxication/withdrawal*
   2. medication use is related to disturbance
C. Disturbance is NOT better accounted for by a psychotic disorder that is NOT substance induced
D. Disturbance does not occur exclusively during the course of delirium

**Delirium**
Delirium is a medical condition characterised by a **vacillating general disorientation**, which is accompanied by cognitive impairment, mood shift, self-awareness, and inability to attend (the inability to focus and maintain attention). The change occurs over a **short period of time** - hours to days - and the disturbance and consciousness **fluctuates** throughout the day.

How to distinguish it?
- In schizophrenia abnormal behaviour, speech and stereotyped motor activity occur in the absence of disorientation
In schizophrenia patient is alert and although delusions and hallucinations persist you can still do formal testing
Delirious patient appears hapless and disorientated between phases of lucidity
Manic episode could be confused with agitated delirium but delirium has less consistent elevated mood.

**Treatment of Schizophrenia**

*Early and effective treatment* with control of relapses has been shown to decrease the degree of cognitive decline.
SCZ causes IMPAIRMENT OF INSIGHT therefore patients cannot be expected to be reliable in taking their treatment. The burden of care falls on the healthcare workers and family

**Excellent results** have been achieved in low and middle income countries by *combining depot IMI antipsychotics with an assertive monitoring program* run by PHC staff (see NEPAD study).

If it is the patients first episode start an oral antipsychotic. When the diagnosis of schizophrenia is confirmed switch to IMI (preferably)

First episode:
- Haloperidol 1mg po daily. Increase up to 5mg daily (max) if no response.
- Risperidone 2mg po daily initially. (Fewer EPSEs but not always available) Max dose 8mg, often worth dividing 12 hourly for better effect.
- Chlorpromazine 75-300mg po daily
- If no response after 4-6 weeks, switch treatment

Established Schizophrenia; especially if adherence issues
- Fluphenathixol decanoate 20-40mg every 4 weeks. (Start at 20mg and increase of no response)
- Fluphenazine decanoate 12.5mg – 25mg – 50mg every 4 weeks
- Zuclophenthixol decanoate 200mg – 400mg – 600mg IMI every 4 weeks

Review monthly until stable and then 3 monthly (can get injections at clinic).
Duration of treatment: no reliable predictors of who will do well if treatment is discontinued. Most patients will relapse if treatment is discontinued.

**Look for EPSEs**! If patient develops EPSEs, then:
- Switch from Haloperidol or Chlorpromazine to Risperidone
- Add an anticholinergic agent
- Orphenadrine 50mg daily – ↑ to BD if required – up to 150mg daily max
- NB anticholinergics may cause: Tardive dyskinesia, dry mouth, urinary retention, confusion in elderly

If a patient develops Akathisia (“ants in the pants”) can use Propranolol 20mg daily/ BD

*If treatment resistant – refer to Psychiatrist* – may need to use second generation antipsychotics or Clozapine

Also consider:
Consider: bio-psycho-social-spiritual (details above)
Bipolar Mood Disorder (BPMD)

Diagnosis:
BPMD is a lifelong illness with an episodic, variable course. The presenting episode may be manic, hypo-manic or depressive. Diagnosis requires a current or previous episode of mania or hypo-mania, and a past or current major depressive episode. Key to accurate diagnosis is the clinician seeing the patient on multiple occasions.

Diagnosis of Mania:
A. A distinct period of abnormally and persistently elevated, expansive, or irritable mood, lasting at least one week (or any duration if hospitalisation is necessary)
B. During the period of mood disturbance, three (or more) of the following symptoms have persisted (four if the mood is only irritable) and have been present to a significant degree:
   1. Inflated self esteem or grandiosity, potentially incl grandiose delusions
   2. Decreased need for sleep (e.g. feels rested after only three hours of sleep) or persistent difficulty falling asleep
   3. More talkative than usual or pressure to keep talking
   4. Flight of ideas or subjective experience that thoughts are racing
   5. Distractibility (i.e. attention to easily drawn to unimportant or irrelevant external stimuli)
   6. Increasing goal directed activity (either socially, at work or school, or sexually) or psychomotor agitation
   7. Excessive involvement in pleasurable activities that have a high potential for painful consequences (e.g. engaging in unrestrained buying sprees, sexual indiscretions, or foolish business investments)
C. The symptoms do not meet criteria for a mixed episode
D. The mood disturbance is sufficiently severe to cause marked impairment in occupational functioning or in usual social activities or relationships with others, or to necessitate hospitalisation to prevent harm to self or others, or there are psychotic features
E. The symptoms are not due to the direct physiological effects of a substance or a general medical condition

Treatment
Consider: bio-psycho-social-spiritual (details above)

NB in Bipolar: establish good care pathways – relationship between family & caregivers, PHC workers, therapists, drs - chronic disease requires collaboration

Acute Mania:
- Stop/ taper antidepressants and other “mood-destructabilisers” including: Flu preparations, codeine, caffeine, quinolone antibiotics, corticosteroids
- Provide physical containment: admit in safe environment; reduce stimulation; provide structured routine
- Short-term use of benzodiazepines for chemical restraint
  - Lorazepam 2mg IMI/ po BD
  - Or Clonazepam 2mg IMI/po 8hrly
• **If first episode:**
  o Risperidone 2mg (up to 8mg) po dly initially and then:
  o When patient can adhere to treatment: Lithium or Valproate

• **If already on antipsychotic or mood stabilizer then:**
  o Check adherence (collateral, medication levels)
  o If developed mania while adherent on Valproate ensure optimal dose
  o If on optimal dose and still developed mania whilst adherent to treatment: add Risperidone

• **Lithium vs Valproate:**
  o Lithium is the drug of choice BUT has a narrow therapeutic range with severe toxic side effects.
  o In our setting use Valproate (Epilim)
    ▪ Start at 300mg BD and ↑ to max 20mg/kg/day in divided doses

**Acute Depression:**
• If the patient is treatment naïve but you believe this to be the first episode of a Bipolar Depression
  o Start Fluoxetine 20mg po am AND Olanzepine 5mg po nocte

• **If the patient is already on a mood stabilizer:**
  o Optimize the dose
  o If already on maximal dose Valproate, then there are a few options:
    o Add Fluoxetine 20mg po am AND Olanzepine 5mg po nocte
    o Or Lamotrigine 25mg po dly. Increase by 25-50mg every 2weeks until 100-200mg dly
    o Or add Carbamazepine 100mg BD. Increase by 100-200mg weekly until response (max dose 600mg BD) (C/I if on ART)

• NB: If adding an SSRI follow up at 1-2 week intervals to ensure 1) no reflex mania 2) improvement in depressive symptoms
  o If response to treatment with Fluoxetine & Olanzepine at 4 weeks continue (same dose)
  o If no response to treatment increase the dose: Fluoxetine 40mg po am AND Olanzepine 10mg po nocte

• If all the above steps have been followed and still no improvement – refer to a Psychiatrist

• Any patients on atypical antipsychotics (eg Risperidone, Olanzepine) need regular monitoring for metabolic side-effects: BMI, waist circ, weight, serum glucose and lipids

• Do not use antidepressants as mono therapy in bipolar patients

Refer any patient with BPMD to a psychiatrist if: rapid cycling/ mixed features; treatment resistant depressive episodes; manic episodes not responding to treatment; suicidality
Suicidality

Different phenotypes of suicidal behaviour:
1. Suicidal ideation: recurrent thoughts about suicide (women > men)
2. Suicide attempts: increased level of intent (women 2 x men)
3. Suicide completion (men 3 x women)

Suicide deaths (completed suicides) incidence peaks in adolescence; middle-aged adults and again after 65 years
- 95% meet criteria for at least one psychiatric illness
- 60-70% meet criteria for a mood disorder

Every suicide attempt increases the risk for a further attempt therefore very important to treat the underlying mental illness

Management
- Establish rapport, be empathetic
- Conduct a suicide risk assessment: ask directly about suicidal thought, plans, intentions, activities, letters
- High risk for suicide completion: middle-aged man, definitive plan, little remorse, lethal method, steps towards completion (wills, notes etc)
- Assess stressors (internal eg mood, substances and external eg marital, IPV, financial etc)
- Identify protective factors and evaluate social support
- Ensure adequate supervision: hospitalization or outpatient if low risk

Medication
- **SSRIs are protective!** (lower prescription rates correlate with higher suicide rates)
- TCAs lethal in overdose
- Clozapine decreases the risk of suicidal behaviour three-fold

Psychosocial
- Counselling to train patients to regulate their emotions more effectively
- Family focused therapies
- CBT: in some studies, showed 50% reduction in suicide attempts
- Managing chronic suicidality: Have an emergency plan i.e. CALL: trusted friend, Doctor, ambulance, suicide helpline

NB Managing the negative counter-transference: admit and recognize if you have negative emotions towards the patient – it is more likely that you won’t act on it if it is a conscious thought

Remember that women are more likely to attempt suicide – this is frequently related to feelings of helplessness and inability to change their circumstances (physical, emotional, sexual abuse or neglect, intimate partner violence; higher burden of care for families, children, elderly; increased incidence of mood and anxiety disorders) – they need compassion and assistance.
### Miscellaneous Clinical (Adults and Children)

**Who can Consent**

This guide was prepared by the Medical Protection Society and is hereby acknowledged.

<table>
<thead>
<tr>
<th>Circumstance</th>
<th>Age at which patient can consent</th>
<th>Relevant Act</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical treatment</td>
<td>12</td>
<td>Section 129 of the Children's Act 2005</td>
<td>A child of 12 or older may consent to medical treatment.</td>
</tr>
<tr>
<td>Surgical treatment</td>
<td>12</td>
<td>Section 129 of the Children's Act 2005</td>
<td>A child of 12 or older may consent with a parent’s or guardian’s assent.</td>
</tr>
<tr>
<td>HIV test</td>
<td>12</td>
<td>Section 130 of the Children's Act 2005</td>
<td>Consent for an HIV test may be given by a child of 12 or older, or by a younger child with sufficient maturity to understand the implications of the test.</td>
</tr>
<tr>
<td>Termination of pregnancy</td>
<td>No lower age limit.</td>
<td>Section 5 of the Choice on Termination of Pregnancy Act 92 of 1996</td>
<td>5(2) &quot;no consent other than that of the pregnant woman shall be required for the termination of a pregnancy.&quot; For the purposes of this Act, &quot;woman&quot; means any female person of any age.</td>
</tr>
<tr>
<td>Virginity test</td>
<td>16</td>
<td>Section 12 of the Children's Act 2005</td>
<td>It is illegal to carry out a virginity test on someone under the age of 16. If they are 16 or older, a test may be carried out only with their written consent.</td>
</tr>
<tr>
<td>Circumcision (males only)</td>
<td>16 (males only)</td>
<td>Section 12 of the Children's Act 2005</td>
<td>Female circumcision is illegal at any age. Male circumcision is permissible under specific circumstances (see page 10).</td>
</tr>
<tr>
<td>Sexual intercourse</td>
<td>16</td>
<td>Sections 1, 15, 16 &amp; 57 of the Criminal Law (Sexual Offences and Related Matters) Amendment Act 32 of 2007</td>
<td>Section 54 of the Act places an obligation on anyone with knowledge (or a reasonable suspicion) of a sexual offence against a child to report it to the police. There are harsh penalties for failure to report.</td>
</tr>
<tr>
<td>Minor with parental responsibility for a child</td>
<td>12</td>
<td>Section 129 of the Children's Act 2005.</td>
<td>A child-parent of sufficient maturity may consent to medical or surgical treatment on her child's behalf.</td>
</tr>
</tbody>
</table>
Basic Fracture Management


Next best: follow these simple steps – and ask when you’re unsure!

Open or closed? Open fractures need washout and antibiotics
Mechanism of injury? Think about associated fractures (eg. Weber C, spine if fall from a height, pathological fractures, Monteggia / Galeazzi)
Fracture pattern? How will this influence healing?
Displacement? Is it acceptable or is MUA required?
Angulation? MUA now, or wedge later?
Rotation? X-ray joint above and joint below!

How long will it take to heal?
As a rough guide:

<table>
<thead>
<tr>
<th></th>
<th>Upper limb</th>
<th>Lower limb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child</td>
<td>3-4 weeks</td>
<td>6-8 weeks</td>
</tr>
<tr>
<td>Adult</td>
<td>4-6 weeks</td>
<td>8-12 weeks</td>
</tr>
</tbody>
</table>

Conservative vs Operative management?
In our part of the world, the default setting is conservative. Discuss with a senior if you are unsure. For medico-legal reasons it may be necessary to refer in order to document an opinion from BOH, especially if the gold standard is ORIF.

Get the POP right!
Choose above or below joint plasters correctly (ask!) and ensure they are applied as you intended if you aren’t doing it yourself.
Ensure good education regarding POP risks is given to the patient.
Design POP for maximum safety and practicality (backslab vs full POP etc)
Always apply a little more plaster than you think is necessary

MUAs
Take consent
Do under safe sedation in Casualty
Get a post-MUA X-ray

Involves therapy
Crutches / walking frames
Post-fracture rehab

Review dates
When will you have to make another decision about how to manage the fracture?
Record what the purpose of the next visit is to save time next time
State if for POP off or XR (or both) on arrival
**Common Fracture Types**

**Colles fractures of the distal radius**

<table>
<thead>
<tr>
<th>View</th>
<th>Measurement</th>
<th>Normal</th>
<th>Acceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP</td>
<td>Radial height</td>
<td>13mm</td>
<td>&lt;5mm shortening</td>
</tr>
<tr>
<td></td>
<td>Radial inclination</td>
<td>23 degrees</td>
<td>Change &lt;5°</td>
</tr>
<tr>
<td></td>
<td>Articular stepoff</td>
<td>Congruous</td>
<td>&lt;2mm stepoff</td>
</tr>
<tr>
<td>Lateral</td>
<td>Volar tilt</td>
<td>11 degrees</td>
<td>Dorsal angulation &lt; 5°</td>
</tr>
</tbody>
</table>

Table and image from [https://www.orthobullets.com/trauma/1027/distal-radius-fractures](https://www.orthobullets.com/trauma/1027/distal-radius-fractures)

**Salter-Harris fractures**

Generally, types 1 & 2 require MUA and follow up, types 3-5 need referral for ORIF

Image from [https://www.drugs.com/cg/salter-harris-fracture-discharge-care.html](https://www.drugs.com/cg/salter-harris-fracture-discharge-care.html)
Supracondylar fractures
Modified Gartland Classification
Type 1  Fat pad present, or minimal displacement.
Type 2  Anterior humeral line runs anterior to capitellum
Type 3  Displaced – no meaningful cortical continuity

Types 2 and 3 require MUA. You may need to admit initially for swelling to subside. Check neurovascular function first, especially in type 3.

Image from https://www.researchgate.net/figure/Gartlands-classification-of-supracondylar-fractures-of-the-humerus_fig10_307577782

Ankle fractures
• Ankle fractures are commonly encountered. Don’t underestimate how tough your patient is. The Ottawa rules seldom apply, and people regularly present several days late walking on a fracture, but seldom with a sprain.
• Assess the joint space around the talus. It should be essentially equal all around. If not, the fracture needs reduction to achieve this.
• Medial malleolus and Weber A fractures can be managed conservatively. Weber B and C ideally need ORIF, but resources don’t always allow this. Always try to optimize the position before referring.
• Fractures with significant swelling should be admitted for rest and elevation for 48 hours post fracture, to reduce the risk of compartment syndrome post POP

In the absence of an X-ray, and as a good guide, this picture shows the correct alignment of the ankle:

Image from https://surgeryreference.aofoundation.org/or thopedic-trauma/adult-trauma/malleoli/basic-technique/malleoli-fracture-management-with-minimal-resources?searchurl=%2fSearchResults#re duction-of-displaced-ankle-fractures

See also excellent description of reduction techniques.
The Angle on Ortho
Use this guide if you’re not sure what angle is acceptable for a fracture

Metacarpal #s:
- Angulation: Acceptable if <10° in AP or Lat views
  BUT
  - <20° acceptable in metacarpal metaphysis lateral view
  - <45° acceptable in neck of 5th metacarpal lateral view
- Rotation: No rotation deformity acceptable
- Contact: >50% contact between # ends acceptable

Radio-Ulnar #s:
- <10° angulation on AP and Lat views acceptable.

Tibial #s:
- Angulation:
  - AP view < 5° acceptable
  - Lateral view < 10° acceptable
- Rotation: <10° angulation acceptable
- Shortening: < 1cm shortening acceptable
- Contact: > 50% contact between # ends acceptable
**Head Injuries**

Adults who present to hospital with a history of head injury need careful assessment, a decision re imaging, observation and discharge once safe. Follow these guides to ensure that.

1. Resuscitate patient as required
2. Use the guides below to:
   a. **Decide if they need a CT Brain** and
   b. **Assess the C-spine**
3. If there is no indication for imaging, consider:
   a. Patient intoxicated – not meeting criteria for CT Brain
      i. GCS 13-15 – observe, expect GCS to rise by 1 point/ hr
      ii. If GCS drops or fails to improve, then book CT Brain
   b. Discharge criteria
      i. GCS 15
      ii. Patient no longer intoxicated
      iii. Responsible person to accompany patient (if possible)
      iv. Head Injury Advice Sheet provided

**Decide if they need a CT Brain**

[Diagram of decision-making flowchart]

---

**NOAC** - Novel Oral Anti-Coagulant e.g., Rivaroxaban

*High risk for neurological intervention
†Medium risk for brain injury on CT scan
**Pedestrian or cyclist struck by vehicle; occupant ejected from vehicle; fall from height > 1m or 5 stairs
†Raccoon eyes, haemotympanum, CSF otorrhoea/rhinorrhoea, Battle's sign

Miscellaneous – Head Injuries 179
C-spine Injuries

Head injury guidance taken from Helen Joseph Emergency Department Protocol Handbook by Dr L Goldstein

Sometimes, trying to remember what constitutes a normal cervical spine radiograph can be difficult. There’s a reminder of the important things to look for on the next page.
Normal C-spine radiograph

Image from: www.ebmconsult.com
There is a wealth of other information there worth checking out too.
Maxillofacial Imaging

Some tips for interpretation:
- Select the appropriate radiograph base on the area of interest.
- Compare the sinus fluid levels on either side.
- Check for crepitus or deformities.
- Assess Occlusion
- Assess bite strength – can the patient break a tongue depressor in their bite? (If so, local fracture of maxilla or mandible unlikely.)
- Clinically assess ocular movement and paraesthesia in the region.
- Check the continuity of the Mcgrigor and Trapnell lines.

<table>
<thead>
<tr>
<th>Anatomical Area of Interest</th>
<th>Radiographic Projection</th>
<th>Confirmatory Projection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frontal bone</td>
<td>Lateral Cephalogram</td>
<td>Waters view</td>
</tr>
<tr>
<td>Frontal sinus</td>
<td>Lateral Cephalogram</td>
<td>PA Cephalogram</td>
</tr>
<tr>
<td>Orbit</td>
<td>PA Cephalogram</td>
<td>Waters view</td>
</tr>
<tr>
<td>Zygoma</td>
<td>Waters view</td>
<td>Orthopantomogram</td>
</tr>
<tr>
<td>Zygomatic arch</td>
<td>Submentovertex</td>
<td>Waters view</td>
</tr>
<tr>
<td>Nasal bones</td>
<td>Lateral Cephalogram</td>
<td>Waters view</td>
</tr>
<tr>
<td>Nasal cavity</td>
<td>PA Cephalogram</td>
<td>Waters view</td>
</tr>
<tr>
<td>Maxilla</td>
<td>PA Cephalogram</td>
<td>Lateral Cephalogram</td>
</tr>
<tr>
<td>Maxilla sinus</td>
<td>Waters view</td>
<td>PA Cephalogram</td>
</tr>
<tr>
<td>Mandible-Condylar head</td>
<td>Reverse Towne</td>
<td>Lateral ramus</td>
</tr>
<tr>
<td>Mandible-Condylar neck</td>
<td>Reverse Towne</td>
<td>Lateral ramus</td>
</tr>
<tr>
<td>Mandible-Coronoid process</td>
<td>Waters view</td>
<td>Lateral ramus</td>
</tr>
<tr>
<td>Mandible-Ramus</td>
<td>Orthopantomogram</td>
<td>Lateral ramus</td>
</tr>
<tr>
<td>Mandible-Body</td>
<td>Orthopantomogram</td>
<td>Oblique body</td>
</tr>
<tr>
<td>Mandible-Symphysis</td>
<td>Orthopantomogram</td>
<td>Submentovertex</td>
</tr>
</tbody>
</table>

If you are unsure about any aspect of maxilla-facial trauma care, please discuss with the dentists before referring to Mthatha.
Crush Syndrome

Crush syndrome is often associated with survivors of disasters such as earthquakes, but we see it most frequently after significant assault. Be alert to the danger in anyone who has experienced significant muscle damage. (Remember in compartment syndrome or vascular injury too.)

Fluid management will save their life
- Put up TWO big lines
- Put in a urinary catheter so you can manage output accurately
- Give 2 litres NORMAL SALINE (0.9%) in the first two hours
  - Avoid Ringers and other K+ containing fluids
- Thereafter, aim for 500ml/hour to maintain urine output at minimum 2-3 ml/kg/hour
- Continue fluid management for 24 hours and then reassess

Investigations
- Baseline: U&E, CK, CMP
- Dipstix: Myoglobinuria = Blood on dipstix but no RBC on microscopy
- Urine pH
- Repeat U&E at 24 hours.
- If lab not available, monitor Potassium using ECG. Life-threatening hyperkalaemia is the biggest acute risk.
- If treating crush syndrome, repeat bloods and U-dip every 24 hours.

Treating or preventing?
- Most post-assault patients arrive relatively early at hospital and we are preventing crush syndrome with our management. If U&E and Urine remain normal you have succeeded and can discharge at 24 hours with instructions for increased oral fluids. (Assuming no other injuries.)
- If crush syndrome becomes established (late arrival / extensive injury etc) then you need to treat it.
  - Tea-coloured urine
  - Less than 1ml/kg/hr urine output
  - Deranged U+E

Treatment
- Urine output goal becomes 200-300ml per hour (!) as long as no signs of fluid overload. Adjust fluids accordingly.
- Continue IV fluid to target the 200-300ml/hr goal until the disappearance of myoglobinuria and CK beings to improve – this may require several days. Then begin to taper fluids.
- If signs of acidosis or severely dehydrated alkanise the urine by following every two litres normal saline (0.9%) followed by one litre half-normal (0.45%) saline plus 50mEq sodium bicarbonate.
- In severe cases you may consider mannitol, but the risks of harm from inadequate monitoring are real, and benefit slight, so be sure of your actions
- Do not use diuretics unless there are signs of volume overload
Manage complications
- Patients with crush syndrome are prone to:
  - Sepsis
  - ARDS
  - DIC
- Haemodialysis is indicated for the usual reasons

Discharge criteria
- If crush syndrome prevented, discharge after a normal U&E and urine at 24h
- If crush syndrome treated, discharge when U&E has been normal for 48 hours
Appendicitis – Have You Considered Antibiotics?

It used to be taught that appendicitis was a purely surgical disease – that surgery was always indicated acutely (except in some circumstances such as an appendiceal mass). This is no longer absolutely the case.

The resource UptoDate had this update in August 2020:

“Growing evidence suggests that nonoperative management (NOM) of appendicitis with antibiotics in children may have acceptable outcomes. In a prospective, multi-centre study of over 1000 children with early appendicitis and clinical findings indicating a low risk for perforation, the rates of complication-free treatment success (resolution of symptoms, no surgery during initial hospitalization, and no recurrent appendicitis) in those who chose NOM were 85 percent of patients during the initial admission and 67 percent after one year of follow-up. Compared with surgery, the 370 children undergoing NOM had fewer days of disability at one year but higher rates of emergency department visits and readmissions.”

Early appendicitis (non-perforated) can be treated with antibiotics provided certain criteria are met. Not all surgeons feel comfortable about this, but it may be a particularly good choice for some patients. It is important to choose carefully which treatment modality is appropriate in each case.

Patient selection is critical.
1. Abdominal pain for <48 hours
2. White blood cell (WBC) count ≤18,000/microL
3. Normal C-reactive protein
4. No preoperative concern for rupture based upon clinical findings
5. No appendicolith present on imaging*
6. Appendix diameter ≤1.1 cm on imaging*
   [* If ultrasound not available a decision will require an honest assessment of the degree of confidence you have in the clinical and lab findings.]

Importantly opinion is more divided when it comes to adults. Although the numbers are similar, be aware that older patients, immune-compromised patients and those with co-morbidities were not included in the trials. They may have simultaneously more to gain and more to lose, so wisdom is required.

So, if you are considering management with antibiotics:
1. Make the decision in conjunction with a senior doctor
2. Counsel the patient regarding risks; it may be prudent to take formal consent.
3. Admit, and monitor carefully – indicate planned review times at least 4 hourly and stick to them, Make sure you handover to on call staff.
4. Refer early if you are worried, can’t monitor closely, or the patient deteriorates.
5. Use IV antibiotics for 3 days (we prefer Ceftriaxone 2g BD and Metronidazole 400mg PO TDS, but there’s no standardised approach); then consider changing to orals for 7-10d
6. Ensure good education on discharge
Constipation

Constipation is a common presenting complaint but also frequently discovered incidentally. A careful history of bowel habit and duration is important.

The beginning and end of constipation is DIET. Please refer to the dietician!

Apart from diet, consider other causes, e.g. Hirschprungs in kids and cancer in adults...

The treatment arsenal
- Suppositories (glycerine) – for defecatory dysfunction (eg spinal cord injury) or to help liquefy impacted stool
- Osmotic laxative (lactulose or sorbitol) – help with acute treatment as well as maintenance
- Stool lubricant (liquid paraffin) – can be used with osmotic option
- Fleet enema. Repeated enemas should be used with caution in elderly. Take care to give the correct volume in children (2-4yr 32ml; 5-12yr: 64ml)
- Warm water enema. Use 20ml/kg via a rectal catheter.

Bowel washout Regimen

Indication
Child presenting with abdominal pain, features of constipation (may have overflow diarrhoea) and AXR showing faecal loading

Treatment
- Counselling and explanation
  - Golytely / Kleenprep at 15-25ml/kg/hour (children)
    - Adults: 250ml every 15 min up to total of 4 litres
  - Mix solution with artificial sweetners only – no sugars
  - Give a fleet enema within the first hour
  - Remember risk of aspiration and manage appropriately to prevent this
  - Continue with solution until rectal effluent clear – usually takes 6-8 hours

Maintenance treatment
It is important to follow washout with maintenance treatment for several months / years!!
- Follow up with dietician
- Use combination of
  - Osmotic laxative (lactulose or sorbitol)
  - Stool lubricant (liquid paraffin)
- Stimulating laxatives are not recommended in children
- If < 1yr old give glycerine suppositories
Malaria

The majority of malaria cases in South Africa are due to Plasmodium Falciparum. This disease can be severe and fatal. Maintain a high index of suspicion in cases with travel history, fever, rigors and body pains. Keep in mind, people in malaria-free areas can sometimes also get “taxi-malaria”, when the travel history belongs to the mosquito. Always keep malaria on your radar!

Diagnosis can be made on blood smear microscopy or with a Malaria antigen rapid diagnostic test.

Malaria is a notifiable disease

Complicated (Severe) Malaria

This is a medical emergency. Treat at the highest available level of care.

<table>
<thead>
<tr>
<th>Clinical Features</th>
<th>Lab Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impaired LOC</td>
<td>Hypoglycaemia (HGT &lt; 2.2)</td>
</tr>
<tr>
<td>Inability to sit/stand</td>
<td>Metabolic acidosis (Bicarb &lt; 15)</td>
</tr>
<tr>
<td>Convulsions (multiple)</td>
<td>Normocytic anaemia (Hb &lt; 7)</td>
</tr>
<tr>
<td>Acidotic breathing/ resp distress</td>
<td>Hyperparasitaemia (&gt; 4%)</td>
</tr>
<tr>
<td>Acute pulm oedema/ ARDS</td>
<td>Haemoglobinuria</td>
</tr>
<tr>
<td>Circulatory collapse</td>
<td>Hyperlactataemia (Lactate &gt; 5)</td>
</tr>
<tr>
<td>Anuria</td>
<td>Renal impairment (Creat increase &gt; 26µmol/l in 48 hours)</td>
</tr>
<tr>
<td>Jaundice</td>
<td>Pulm Oedema (on CXR)</td>
</tr>
<tr>
<td>Abnormal bleeding</td>
<td></td>
</tr>
</tbody>
</table>

Treatment

Pre-referral Treatment:
IM artesunate 2.4 mg/kg stat OR
IM quinine 20 mg/kg stat (in divided + diluted doses into anterior thigh)
Co-infection is common, therefore cover with 3rd gen Cephalosporin

Definitive treatment
- Parenteral artesunate (Garsun®), until oral therapy is tolerated / for first 24 hrs. Thereafter Coartem® for 3 days

When to Admit:
- Any features of severe malaria
- Danger signs
- Unable to drink/feed
- Repeated vomiting
- Lethargy
- Unable to sit/stand
- Any convulsions
- Suspected treatment failure
- High risk groups e.g. HIV/pregnant/elderly/children
**Uncomplicated Malaria** (Can be managed as an outpatient)
- Co-artem® (artemether/lumefantrine) [Advise to take with a fatty meal]
- Monitor for vomiting 1 hour post initial dose. If patient vomits, treatment must be repeated.

**Chemo Prophylaxis**

<table>
<thead>
<tr>
<th>Drug Name</th>
<th>Uses</th>
<th>Directions for Use</th>
<th>Adverse Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Larium ® (Mefloquine)</td>
<td>Best for long term prophylaxis (&gt; 6 months)</td>
<td>Start at least one week before entering a malaria area, take weekly while there and for FOUR weeks after leaving the area.</td>
<td>Headaches, insomnia, suicide, neuro-psychiatric symptoms, spatial disorientation</td>
</tr>
<tr>
<td></td>
<td>Not good for pilots/underwater divers.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Safe for children &gt; 3 months</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Safe in breastfeeding and 2⁰/3⁰ trimester</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malarone® (Atovaquone &amp; Proguanil Hydrochloride)</td>
<td>Best safety profile. Better for short-term travellers</td>
<td>Start one/two days before entering malaria area, take daily &amp; for SEVEN days after leaving the area.</td>
<td>Nausea, headache</td>
</tr>
<tr>
<td>Doxycycline</td>
<td>Not for breastfeeding/pregnancy or &lt; 8 years of age. Safest with TB treatment and ARV’s</td>
<td>Start one day before entering a malaria area, take daily for FOUR weeks after leaving the malaria area</td>
<td>Photosensitivity, GIT side effects, blurred vision.</td>
</tr>
</tbody>
</table>
Rabies

Rabies is a universally fatal disease. Prevention is better than (non-existent) cure.

Exposure
Exposure is categorised as follows:

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category 1</td>
<td>Touching or feeding animal. Licks on intact skin</td>
</tr>
<tr>
<td>Category 2</td>
<td>Minor scratches and abrasions</td>
</tr>
<tr>
<td>Category 3</td>
<td>Any transdermal exposure: scratch or bite, mucosal exposure, lick on broken skin</td>
</tr>
</tbody>
</table>

History is crucial for assessing risk. A known aggressive dog defending its territory is a much lower risk than an unknown stray acting strangely!

- What is the local incidence of rabies?
- Was it a known animal?
- Was the animal immunized?
- Was the animal behaving abnormally?
- Is the animal still alive? (If the animal is alive and well >10 days after exposure, rabies prophylaxis can stop.)

Vaccine schedule
All exposure categories warrant active immunisation with vaccine. (If reliable history and considered low risk, you may omit for category one.)

- Give one dose on day 0, 3, 7 and 14
- If previously immunized, can give day 0 and 3 only
- If immune compromised, give a fifth dose on day 28
- Give by deep IM injection into deltoid muscle
- If it is >48 hours post exposure at presentation, give double dose on day 0

Human Rabies Immunoglobulin (HRIG)

- Should be given for all Category 3 exposure (and category 2 in HIV)
- Practically, access and stock quantities in rural areas may make this challenging. Nevertheless, genuine high risk exposure needs a plan that includes HRIG.
- The dose is 20u/kg, preferably on day 0, but must be within 7 days
- Infiltrate as much as possible around the wound. If multiple wounds, dilute 1-3 times with normal saline (0.9%) so that all wounds can be infiltrated.
- Give the remainder of the dose deep IM into the deltoid muscle – at a different injection site to the vaccine dose.
- Do not exceed the dose as this will impair the immune response.

Involve the state vet (KSD: Dr Matongo 076-3589615; Mbashe: Dr Mumba 083-4591692) to follow up vaccination of local animals, to arrange study of the brain of deceased animals or to deal with alive symptomatic animals.
**Typhoid Fever**

Typhoid fever is seen intermittently in rural areas. It is endemic in certain communities, but often has different periods of resurgence. It’s included here as a reminder because its presentation can be subtle and easy to miss unless it’s on your radar. Importantly, symptoms in the first week are often non-specific – especially malaise, headache (may even need LP), constipation, spiking fevers. Gastro-intestinal complications can occur from week 2-4. These are usually haemorrhage or perforation. Other severe complications include encephalopathy or toxic myocarditis.

**Diagnosis**
Send blood cultures, alternatively stool cultures. Widal tests are non-specific, but may help.

**Treatment**
Antibiotic treatment should be initiated based on clinical suspicion. This is essential to reduce mortality. Initial treatment is Ceftriaxone 2g 12hrly (if meningitis concern) and then until stable. Change to Ciprofloxacin unless resistance.

Co-infection with bilharzia should be treated to reduce the chance of relapse.

**Follow up**
Due to the possibility of relapse, it is important to follow these patients up.

**Reminder!**
Proven typhoid is a notifiable condition. Please see the relevant guidelines to ensure your patient is notified to the health authorities.

**Normal CSF Values**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Protein (g/l)</th>
<th>Glucose (mmol/l)</th>
<th>Cells per mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal (neonates)</td>
<td>0.2 – 1.5</td>
<td>Normal*</td>
<td>0-10 lymphocytes</td>
</tr>
<tr>
<td>Normal (older)</td>
<td>0.2 – 0.4</td>
<td>Normal*</td>
<td>0-5 lymphocytes</td>
</tr>
<tr>
<td>Aseptic viral</td>
<td>0.2 – 2.0</td>
<td>Normal*</td>
<td>20 to a few 100, mainly lymphocytes**</td>
</tr>
<tr>
<td>Cryptococcal</td>
<td>0.5 – 2.0</td>
<td>Moderate reduction</td>
<td>10-200 mainly lymphocytes**</td>
</tr>
<tr>
<td>Tuberculous</td>
<td>&gt; 1</td>
<td>Moderate reduction</td>
<td>20-500, mainly lymphocytes**</td>
</tr>
<tr>
<td>Pyogenic</td>
<td>&gt; 1</td>
<td>Reduced, may be absent</td>
<td>50 to 1000s, nearly all polymorphs***</td>
</tr>
</tbody>
</table>

* Normal CSF concentration is about two-thirds of blood glucose concentration
** In early stages, polymorphs may predominate
*** No cell count result can completely exclude bacterial meningitis
Traditional circumcision

Efforts to make traditional circumcision safer for young men mean that the health system is increasingly part of the process.

Pre-circumcision check

• Ensure the young man is older than 16 years, by checking his ID yourself
• Check he’s had an HIV test and RPR – this is a crucial opportunity to screen and educate men!
• In the Covid19 era, do a rapid Covid antigen test
• Listen to the heart – ensure murmurs are followed up and given prophylactic antibiotics
• Look at the penis! (Infection, warts, even prior circumcision may make any attempt at traditional circumcision unsafe.)
• Educate about staying hydrated. Some schools still teach that young men should not drink for a whole week (to reduce urine / as a challenge). This is a major contributor to the deaths that occur.
• Educate about seeking help early if any signs of sepsis.

Septic circumcision

• Focus on hydration and broad-spectrum antibiotics
• Pass a urinary catheter earlier rather than later
• Choose a dressing (often aquacel, but see Dressing Table in Therapeutic section) and frequency of wound review.
• Admit if any concerns
Dermatology – Some Common Skin Conditions

It is our experience that skin conditions, especially atopic eczema, are usually under-treated, resulting in unnecessary morbidity.

SOME HELPFUL DEFINITIONS IN DESCRIBING SKIN THINGS:

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macules</td>
<td>Flat, nonpalpable lesions usually &lt; 10 mm in diameter. Macules represent a change in color and are not raised or depressed compared to the skin surface.</td>
</tr>
<tr>
<td>Patch</td>
<td>Large macule</td>
</tr>
<tr>
<td>Papules</td>
<td>Elevated lesions usually &lt; 10 mm in diameter that can be felt or palpated</td>
</tr>
<tr>
<td>Plaques</td>
<td>Palpable lesions &gt; 10 mm in diameter that are elevated or depressed compared to the skin surface. Plaques may be flat topped or rounded</td>
</tr>
<tr>
<td>Nodules</td>
<td>Firm papules or lesions that extend into the dermis or subcutaneous tissue</td>
</tr>
<tr>
<td>Vesicles</td>
<td>Small, clear, fluid-filled blisters &lt; 10 mm in diameter</td>
</tr>
<tr>
<td>Bullae</td>
<td>Clear fluid-filled blisters &gt; 10 mm in diameter</td>
</tr>
<tr>
<td>Pustules</td>
<td>Vesicles that contain pus</td>
</tr>
<tr>
<td>Urticaria</td>
<td>(wheals or hives) is characterized by elevated lesions caused by localized edema. Wheals are pruritic and red. Wheals are a common manifestation of hypersensitivity to drugs, stings or bites, autoimmunity, and, less commonly, physical stimuli including temperature, pressure, and sunlight. The typical wheal lasts &lt; 24 h.</td>
</tr>
<tr>
<td>Scale</td>
<td>Heaped-up accumulations of horny epithelium</td>
</tr>
<tr>
<td>Crusts (scabs)</td>
<td>Dried serum, blood, or pus</td>
</tr>
<tr>
<td>Erosions</td>
<td>Open areas of skin that result from loss of part or all of the epidermis. Erosions can be traumatic or can occur with various inflammatory or infectious skin diseases. An excoriation is a linear erosion caused by scratching, rubbing, or picking</td>
</tr>
<tr>
<td>Ulcers</td>
<td>Result from loss of the epidermis and at least part of the dermis</td>
</tr>
<tr>
<td>Petechiae</td>
<td>Nonblanchable punctate foci of haemorrhage</td>
</tr>
<tr>
<td>Purpura</td>
<td>Is a larger area of haemorrhage that may be palpable</td>
</tr>
<tr>
<td>Atrophy</td>
<td>Is thinning of the skin, which may appear dry and wrinkled, resembling cigarette paper</td>
</tr>
<tr>
<td>Scars</td>
<td>Areas of fibrosis that replace normal skin after injury. Some scars become hypertrophic or thickened and raised. Keloids are hypertrophic scars that extend beyond the original wound margin</td>
</tr>
<tr>
<td>Telangiectasis</td>
<td>Foci of small, permanently dilated blood vessels</td>
</tr>
</tbody>
</table>
ATOPIC ECZEMA (AE)
It is a chronic disease that requires aggressive management to control it and then ongoing management to prevent recurrence. Review patients every 3-6 months.

Severe Chronic Atopic Eczema Management
Treatment regime, preferably in this order:
1. **Educate** the patient about AE – include all you can tell them about the condition. Tell them what to avoid and what to use instead. Warn them about the chronicity of the condition. Tell them to expect frequent flares, possibly be accompanied by either bacterial and/or viral infections.

2. **Bathing**
   - Avoid all soaps, particularly those with scent and colour.
   - Wash with aqueous cream (on skin or dissolve in water)
   - Add 1 teaspoon of Jik to bath once a week

3. **Moisturizers (emulsifying ointment)**
   - Apply immediately after bathing, to improve skin hydration.
   - Do NOT use aqueous as a leave on moisturiser
   - Ensure sufficient ointment to last until next visit.

4. **Topical steroids: if AE is severe:**
   - Start with potent steroid - Clobetasol (Dovate) - for maximum 14 days
   - Usually within 3-5 days a notable improvement allows for tailoring of steroids to betamethasone valerate (lenovate) for the reminder of the flare period
   - Patient to apply betamethasone only on affected areas, continuously until significant improvement is noted
   - Thereafter they should stop all steroids but carry on bathing with aqueous cream followed by applying moisturisers, until a new flare occurs. Consider giving the mother spare tubes of clobetasol and betamethasone cream to use to treat any acute flare ups early.

5. **Antihistamines:** use of sedating antihistamines such as Allergex/ Aterax/ Phenergan should be part of every script for an AE sufferer.

6. **Decolonise staph infections** every month using Bactroban ointment to nares and nails (not currently available to us; ask if access in private viable for pt)

**Treatment of secondary infections**
- Look out for and treat Impetigo (secondary bacterial infection) and/or eczema herpeticum (secondary herpes virus infection) both frequent complications of AE
- Treat Impetigo with flucloxacillin 250mg qid for 1 week or equivalent, depending on availability
- Treat Eczema Herpeticum (EH) with Acyclovir 10-20mg/kg tds for 5-7 days.

If you see a patient for the first time with a severe secondary infection concentrate on clearing the infection and recall the patient after 1 or 2 weeks to restart specific AE treatment. When the secondary infection is not very severe or when you feel it may be difficult to for the patient to come again after 1 week, treating with either flucloxacillin and/or acyclovir should be done concurrently with the AE treatment.
PSORIASIS
Its best to focus on treating psoriasis according to body regions affected:
Scalp:
- Tar shampoo
- Topical corticosteroids (e.g. synalar gel or advantan scalp lotion) during the day
- Salicylic acid, overnight (if scaly)
Face: Hydrocortisone
Torso:
- 5% LPC (liquor picis carbonis) in HEB (emulsifying ointment)
- Betamethasone/5% LPC in HEB – BD
- Salicylic acid, overnight (if scaly)
For Severe disease
- Systemic therapy e.g. Methotrexate
- Ultraviolet light therapy (where available)

MOLLUSCUM CONTAGIOSUM
No treatment – most children will clear eventually. Where treatment is necessary, options include:
- Topical benzoyl peroxide (Benzac) or retinoids – multiple lesions
- Curettage (scraping out tissue with curette, where available)

GENITAL WARTS
We have Imiquimod.
- Apply three times per week
- Protect surrounding skin with vaseline
Other options, where available (we don't have any of these), include:
- Cryotherapy (freezing with liquid nitrogen)
- Podophyllotoxin (Wartec): applied weekly directly onto warts
- Curettage

FUNGAL INFECTIONS
Tinea Capitis or extensive Tinea Corporis:
- Treatment of choice is: Terbinafine for 6 weeks but no longer available.
- So, use fluconazole 100-200mg daily in adults, 6-12mg/kg/d in children (max 600mg) for two weeks
Topical antifungals are ineffective
- Betadine or savlon shampoo for additive antifungal effects
- If scaly, use 2% salicylic acid – overnight

Tinea Corporis: Localised disease: 2 lesions or less
- Topical agents –BD- up to 2 weeks or until clinical resolution
- Any imidazole cream e.g. clotrimazole, or terbinafine cream
- Benzoic acid with salicylic acid e.g. whitfield’s ointment
- Zinc undecanoate (e.g. mycota)
**PAPULAR URTICARIA (insect bites)**
Where possible: Treat pets regularly for fleas. Check mattresses for bedbugs. Fumigate the home if necessary.

**Specific treatment**
- Topical corticosteroids, e.g. lenovate ointment
- 5% LPC in HEB
- Antihistamines
- Treat infected lesions with (topical/systemic) antibiotics

**SCABIES**
Scabies is a disease that occurs in families. It is pointless treating one person only. Ask about other people who live in the same household.
- Treat secondary infections first otherwise the Ascabiol will sting!
  - Treat with Ascabiol (benzyl benzoate)
    - Under 2 months: Sulphur ointment only
    - Infants: Dilute Ascabiol 1:3 with water or aqueous
    - Child under 6yr: Dilute Ascabiol 1:1
    - Over 6yr: Undiluted Ascabiol
    - Advise two applications (15 min apart) at night. Repeat two applications (15 min apart) in the morning and again the next night. (Thus 6 applications in total, no washing in between.) Wash off the following morning. If smaller children don’t tolerate it, dilute it more, leave on only a few hours at a time & offer analgesia.
  - Bed linen and clothes should be washed in boiling water next day (so watch weather). (They can also be left in a black bag for 10 days.)

**ACNE**
Acne is common and frequently undertreated
- Topical treatment is with:
  - Benzac gel (benzyl peroxide 5%) initially. Daily or 12hourly.
  - Tretinoin cream if no or poor response. Use for 6 weeks.
- Add oral doxycycline 100mg daily for three months if moderate acne or response to topical is insufficient. Do not use antibiotics alone.
- Remember oral contraceptive in women (the best option we have is Triphasil as Diane-35 and equivalents not available)
Otitis Media

Poorly treated otitis media can have disastrous effects on an individual’s life. Its complications include chronic recurring ear infections, meningitis, facial nerve paralysis and mastoiditis. It can also result in total deafness. Generally, an acute otitis media results in a temporary conductive hearing loss. When poorly managed, however, and by way of natural communication between the middle and inner through the round and oval windows, the infection tends to spread into the inner. Once infecting the inner ear, hearing loss becomes permanent 😞

Definitions

An inflammation of the mucous membrane lining the middle ear cleft (consisting of the Eustachian tube, tympanic cavity, mastoid antrum and mastoid air cells) produced by pyogenic bacteria

**Acute otitis media (AOM):**

Presents with fever, otalgia, & hearing loss, < 3 weeks

**Middle ear effusion (MEE):**

Build-up of fluid in the middle ear, behind an intact tympanic membrane, without signs and symptoms of acute infection (pain, redness of the eardrum, pus, and fever).

**Chronic otitis media with effusion (COME):**

Build-up of fluid in the middle ear, behind an intact tympanic membrane, without signs and symptoms of acute infection for 3 months or longer

**Chronic otitis media (COM):**

Permanent abnormality of the pars tensa or pars flaccida and/or cholesteotoma. This is most likely due to previous AOM, COME or chronic Eustachian tube dysfunction. Not necessarily suppurative.

**Chronic suppurative otitis media (CSOM):**

*Actively Discharging* Chronic Otitis Media for 3 months or longer

Epidemiology

- 2nd most common disease of childhood
- highest incidence occurs in the 6 and 24 months of age group
  - less common after 7 years of age
  - Higher incidence for boys
  - Common in winter when URTIs are frequent
- Risk factors
  - Bottle feeding, sibling with OM, attending day care, respiratory allergy, parental smoking, swimming in dirty waters

Microbiology

<table>
<thead>
<tr>
<th>Bacteria</th>
<th>Viruses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Streptococcus pneumonia 35%</td>
<td>Respiratory syncytial virus</td>
</tr>
<tr>
<td>Haemophilus influenza 25%</td>
<td>Adenovirus</td>
</tr>
<tr>
<td>Moraxella catarrhalis 15%</td>
<td>Rhinovirus</td>
</tr>
<tr>
<td>Gram negative enteric bacteria 25%</td>
<td>Influenza virus</td>
</tr>
</tbody>
</table>

Infection occurs through spread of the sepsis via

1. Tympanic membrane
2. Haematogenous spread
3. Via the Eustachian tube
Pathophysiology

- Obstruction of the Eustachian tube appears to be the most important even in the aetiology of AOM
- The vast majority of episodes are caused by an airway infection
- The infection of the airway is usually viral
- The inflammation then spreads into the Eustachian tube
- The obstruction of the ET leads to stasis of the middle ear secretions
- Then the pathogenic bacteria colonise the sterile secretions

Symptoms

1. Otalgia: varies in severity from mild to intense pain lasting several hours
2. Hearing loss in the affected ear
3. Otorrhoea
4. Dizziness
5. Symptoms of the predisposing factor

Signs

- Tympanic membrane is inflamed, hyperaemic, bulging and opaque/dull, absent light reflex
- Lack of landmarks (not always obvious to the eye)
- Type B Tympanogram
- Purulent discharge
- Perforation of the tympanic membrane. This sometimes, might be seen with difficulty because of the oedema
- Bulla formation
- Mastoid tenderness
- There may be signs of an upper respiratory infection

Complications

- Acute mastoiditis: before the advent of antibiotics
- Chronic suppurative otitis media
- Labyrinthitis
- Face nerve paralysis
- Bacterial meningitis
- Epidural abscess
- Brain abscess
- Lateral sinus thrombosis

TREATMENT

Please only refer dry ears to audiology. Diagnostic hearing assessments are only possible on dry ears.

✓ Always check with the patient how they clean the discharging ear/s.
✓ Advise them to only dry mop discharging ears.
✓ Advise patients against swimming until the infection has resolved and the perforation has healed.
✓ Advise against the use of “phumphuma” OR washing the ear with soapy water
Who treats what exactly and when to refer

- Acute otitis media – Doctor
- Middle ear effusion – Doctor (Audiologist to help with diagnosis through Tympanometry)
- Chronic otitis media
  - Doctor while active
  - ENT if not resolving (no stop to active discharging)
  - Straight to Audiology if ear/s is dry
  - Audio to ref to ENT with an audiogram
- Resulting hearing loss from AOM/MEE/COM - Audiologist

TREATMENT FOR ACUTE OTITIS MEDIA
1. Aural toilet / dry mopping
2. Oral antibiotics
   a. Antibiotic of choice is still Amoxicillin 90mg / kg / day in divided doses for a duration of 10 days
   b. Another first line antibiotic: co-trimoxazole 960mg bd
   c. Second line antibiotic: Augmentin or second generation cephalosporin like cefuroxime
   d. Penicillin allergy
      i. Azithromycin, oral, 500 mg daily for 3 days
3. Decongestants-Antihistamines (nasal, systemic)
   a. Cetirizine, oral, 10 mg daily for 10 days, or Chlorphenamine (if Cetirizine o/s) 4mg 3-4 times daily
   b. Oxymetazoline nasal drops (1-2 drops 8 hourly, max 5 days)
4. Pain relief with analgesics and anti-inflammatory that include panado and brufen to help reduce the inflammation within the middle ear.

TREATMENT FOR MIDDLE EAR EFFUSION (MEE) / OTITIS MEDIA WITH EFFUSION (OME)
MEE/OME that persists for longer than 3 months have spontaneous resolution rates of only 20-30%, even after years of observation.
1. Refer to audiologist for Tympanometry and diagnostic hearing test
2. Depending on the results, patient to be:
   i. Rebooked for 1/2/3 month review with repeat Tympanometry, or
   ii. Sent back to MO for review of treatment, or
   iii. Booked for further ENT Management

The complications of hearing loss (eg, language delay, behavioural problems, poor academic performance) have led to multiple medical and surgical treatments for OME being investigated. The following are among the many strategies advocated for medical treatment in patients with OME and should be considered:
1. Oral antibiotics
   a. Optimise medical treatment with second line antibiotics
   b. Augmentin or cefuroxime
   c. If Penicillin allergy: Azithromycin 500mg daily for 5 days
2. Antihistamine-decongestants
   a. Cetirizine, oral, 10 mg daily for 10 days, or
   b. Chlorphenamine (if Cetirizine o/s) 4mg 3-4 times daily
c. Oxymetazoline nasal drops (1-2 drops 8 hourly for a maximum of 5 days)

3. Intranasal and systemic steroids
   a. Prednisone tapered down over 5 days can have a significant effect in both children and adults as long as there are no contra-indications. If >6y use intranasal route first

4. Aggressive management of allergic symptoms

TREATMENT OF CHRONIC OTITIS MEDIA: ACTIVE (CSOM)
Not to be referred to Audiology as ear is discharging. Hearing test cannot be performed on discharging ears.
The main aim of treatment is to get the ear dry.
1. Perform ear toilet by syringing the ear with clean body temperature tap water (use a 50ml syringe with a plastic jelco sheath)
2. Dry mop, making sure the patient observes as they will do the same at home
3. Now visualize and ensure no cholesteatoma
4. The following are options for topical treatment:
   a. Ciprofloxacin (or Ofloxacin) drops (Gold standard) - first flush the ear/Eustachian tube to complete the ear toilet - do this by administering 6drops of the Ciprofloxacin and applying tragal pressure (pumping) - the patient should taste the solution. The patient is then to continue this at home - 6drops BD until completion of the bottle. Encourage to keep their ear dry.
   b. Boric Acid - please see below for exclusion criteria. Flush the middle ear and Eustachian tube with 6drops of normal saline and tragal pumping. Now 'tap' Boric acid powder into the external ear canal using a 50ml 'urological' syringe with a wide mouth and compact the powder into the canal using an earbud until the canal is full. Instruct the patient not to disturb and to keep the ear dry.
5. Review the patient in 4 weeks:
   a. If the ear is dry - refer to audiology
   b. If the ear is moist - review in a further 4weeks (most will resolve)
   c. If still actively discharging, then
      i. Take a pus swab for MC&S
      ii. Repeat ear toilet and education with care giver
      iii. Ciprofloxacin oral, 500 mg 12 hourly 5days, Augmentin for children (to be changed according to pus swab results)
      iv. Review patient in 2 weeks with lab results and combine ear drops with the antibiotic drug the organism is sensitive to, give a 1 month review date with Audio

Boric acid use is based on evidence from a 2012 study at Stellenbosch University. It showed single application of Boric Acid powder to be statistically as effective as Gold standard topical quinolone eardrops. It limits the need for patient adherence, is very cost effective, shows no side-effects, unlikely to cause bacterial resistance, and shows promisingly low rates of recurrence.

Exclusion criteria for the study - cholesteatoma, signs of tuberculous otitis media, systemic immunosuppressive disease (e.g. diabetes, HIV/AIDS), grommets, aural polyps, previous middle ear surgery, children under 6years.
Note: there is lack of robust evidence for Acetic acid despite being widely recommended in CSOM and the above study showed it to be very inferior to ciprofloxacin and boric Acid - thus its use is not recommended

**TREATMENT OF CHRONIC OTITIS MEDIA: INACTIVE (COM)**

No discharge… No treatment to be given. Refer to audiologist,
- If at clinic, book for audiology outreach giving the earliest date possible
- If at the hospital, discuss with audiology or book for appropriate day

**Removing Foreign Bodies From The Ear**

<table>
<thead>
<tr>
<th>Type of FB</th>
<th>Method of removal</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living insects</td>
<td>First kill with oil</td>
<td>Removal of live, moving insects can exacerbate oedema and trauma – esp where multiple bite and/or stings occur</td>
</tr>
<tr>
<td>Irregular/graspable objects</td>
<td>Remove with crocodile forceps</td>
<td>FB kit in theatre should have a pair, Audiologist has a pair</td>
</tr>
<tr>
<td>Organic/vegetable</td>
<td>DO NOT SYRINGE</td>
<td>Will swell up making it more difficult to remove</td>
</tr>
<tr>
<td>Button batteries</td>
<td>DO NOT SYRINGE</td>
<td>Arguably the most dangerous FB in the ear, producing tissue necrosis as the alkaline seeps out of them — granuloma formation</td>
</tr>
<tr>
<td>Round, hard, smooth, non-graspable</td>
<td>Syringe/remove with wax hook/removal under anaesthetic</td>
<td></td>
</tr>
</tbody>
</table>
Primary Eye Care

General Points and Examination
- The “vital signs” in eyes are: Vision, Pressure, Pupil and to some extent the red reflex. Please make sure you check these (except IOP which won’t be possible) on all cases to make sure you are not missing anything big.
- A lot can be achieved with a good torch light (ophthalmoscope lights are often not bright enough) and taking a bit of time to look at small details
- Visual Acuity Jargon explained: NLP = No Light Perception, LP = Light Perception, HM = Hand Motion, CF = Count Fingers at 1m, Snellen VA chart 6/60 = Person can see at 6m what a normal person can see at 60m distance (ie this is quite bad) and 6/6 means normal vision
- VA worse than 6/18 means there is a significant decrease in vision

Optometrist referrals
- Find out how to access your nearest optometrist and refer the following:
  - All suspected refractive errors (4 yrs & older)
  - Suspected glaucoma cases for IOP (document your optic disc findings)
  - Cataracts with clear cornea and functioning pupils for surgery screening
  - Follow-up of primary eye conditions if necessary

Squints
- Squint Mx (complicated at best) entails rigorous follow-up and possible surgery. Technically, all squints older than 3 months need referral to an Ophthal centre, but use your own judgement for individual cases. For example, an older child with mild squint present since young age in our setting may be best left at that versus a young child with severe squint/unknown cause /associated abnormalities definitely needs input so refer.

Disability Grants for low vision or blindness
- Blindness in 1 eye will not qualify for a DG unless they used to practice a profession requiring binocular vision (unlikely in our setting)
- The old guidelines used to define visual impairment qualifying for DG as poorer than 6/36 in the best eye after correction
- The new guidelines are much more complex calculating disability as a percentage where one blind eye = 20% disability, both blind = 70-80% etc and to qualify for DG you need about 40%
- Remember to also take the diagnosis into consideration – possibility to improve/deteriorate over time and other “disabling” factors and use the above points to help you decide whether they should apply or not
- Of the top causes of blindness in our area (cataract, glaucoma, corneal scar, DM-related, trauma) only cataracts are potentially reversible

Prosthetic eye service
- This is not offered in our area, but find out if it is in yours!
Common clinical conditions

### THE RED EYE!

**Assessment**
Remember to always stain the cornea with fluorescein if painful or decreased vision to exclude corneal involvement

<table>
<thead>
<tr>
<th>Condition</th>
<th>Cornea</th>
<th>Pupil</th>
<th>Vision</th>
<th>Discharge</th>
<th>Ocular pain</th>
<th>Photophobia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute angle closure glaucoma</td>
<td>Hazy, indistinct</td>
<td>Fixed, mid-dilated</td>
<td>Severely reduced, blurred, halos</td>
<td>Minimal (watery)</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Iritis (ant uv)</td>
<td>May be hazy</td>
<td>Constricted, poor light response</td>
<td>Mildly to moderately reduced</td>
<td>Minimal (watery)</td>
<td>Yes, usually severe</td>
<td>Yes</td>
</tr>
<tr>
<td>Keratitis</td>
<td>Hazy, localised opacity, epithelial defect, unless 2ndry uv</td>
<td>Unaffected</td>
<td>Modestly to severely reduced</td>
<td>Yes, usually watery</td>
<td>Yes, usually severe</td>
<td>Yes</td>
</tr>
<tr>
<td>Sub-conjunctival haemorrhage</td>
<td>Clear</td>
<td>Unaffected</td>
<td>Unaffected</td>
<td>Minimal (watery)</td>
<td>Generally none</td>
<td>No</td>
</tr>
<tr>
<td>Conjunctivitis</td>
<td>Clear</td>
<td>Unaffected</td>
<td>Generally unaffected</td>
<td>Yes; purulent (bacterial), watery (viral)</td>
<td>Yes; gritty or stabbing pain</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Condition</th>
<th>Cornea</th>
<th>Pupil</th>
<th>Vision</th>
<th>Discharge</th>
<th>Ocular pain</th>
<th>Photophobia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conjunctival injection</td>
<td>Clear</td>
<td>Unaffected</td>
<td>Generally unaffected</td>
<td>Yes; purulent (bacterial), watery (viral)</td>
<td>Yes; gritty or stabbing pain</td>
<td>No</td>
</tr>
</tbody>
</table>
Causes and management of red eye

1. **Viral Conjunctivitis**
   Acute onset, often starts in 1 eye then other, pre-auricular lymph node palpable, follicles may be present in palpebral conjunctiva
   Advise regarding contagiousness – hand washing, no touching, no drop sharing, relatives etc
   Treat symptomatically with Spersallerg for max 5/7

2. **Bacterial Conjunctivitis**
   Often bilateral, sticky gritty eye to purulent d/c, also contagious
   Treat with
   - Chloramphenicol eye ointment (IN the eye) 6 hourly for 7 days or
   - Ciprofloxacin drops as second line, 0.3% ophthalmic drops,
     - instill 1 drop 2 hourly for 2 days.
     - then reduce frequency to 1 drop 4 hourly for 5 days

**Neonatal Conjunctivitis: Gonococcal vs Chlamydial**

**Gonococcal:**
Onset on day 1-3, severe purulent d/c
Rx Ceftriaxone 50mg/kg IV dly x 7/7

**Chlamydial:**
Onset on day 4-28, mucopurulent d/c, pre-septal cellulitis
Rx Azithromycin 20mg/kg dly x 3/7

Remember to counsel & Rx the mother (and partner) in both instances

3. **Allergic Conjunctivitis**
   Much confusion exists regarding allergic eye conditions
   Treat acute reactions as allergic conjunctivitis with allergen avoidance, Spersallerg eye drops QID until resolved or max 5/7 and systemic antihistamines if eyelids are involved
   Vernal conjunctivitis is fairly common in children & also seen in young adults
   Presentation is chronic/seasonal pattern
   Limbal form is classic in black people with limbal papillae, white “tranta’s dots” and peri-limbal hyperpigmentation if longstanding
   Use a **stepwise approach** of the available medications:
   1. Allergen avoidance counselling: animals, dust, wind (eg travelling with vehicle window open)
   2. Spersatears to “wash out/dilute” the allergen
   3. Spersallerg short-term to control symptoms (if cold packs are available to them, this is preferable as it achieves the same)
   4. Na-Chromoglycate eye drops long term during season, instill QID
   5. Fluoromethalone (FML) eye drops – reserve for severe, refractive cases, instill QID and taper down when control has been achieved (be aware there are risks involved with the use of ocular steroids)
4. **Uveitis**
   - Most commonly, acute anterior uveitis
   - Presents with pain, photophobia, variable loss of vision, circumciliary injection and miotic pupil
   - Treat with atropine 1% 1 drop 12 hourly and dexamethasone eye drops 1-2 drops 4-6 hourly
   - Refer to ophthalmology if possible

5. **Dry eye**
   - Extremely common in our setting attributed to harsh living conditions and HIV
   - Note that tear film abnormalities may even present with a “teary eye” which paradoxically requires treatment with artificial tears!
   - Prescribe Spersatears frequently (as often as needed initially) then pt can taper down as necessary

6. **Glaucoma**
   - Glaucoma is common, often presents late, always needs referral to ophthalmology, but is frequently under-treated due to the over-burdened system.
     - Open-angle (slow onset loss of vision, often asymptomatic) or
     - Closed angle (acutely painful red eye, often with nausea and vomiting, hazy cornea, fixed semi-dilated pupil and
   - First line treatment: Betaxolol 0.25-0.5%, 1 drop 12-hourly (alt. Timolol seldom available, but use if you have)
   - Add Bimatoprost 0.03% 1 drop daily if β-blocker contraindicated or poor response despite adherence
   - In severe cases, or if prescribed by specialist, or if delay in getting an appointment for evaluation and surgery use Acetazolamide 250mg 6 hourly orally and consider Mannitol 1.5-2g/kg as 20% solution over 30-60 minutes

7. **Corneal ulcer**
   - Disclaimer: this management “protocol” is very different from the 1st world/gold standard approach, but what is deemed reasonable for our setting and resources
   - Stain ANY suspected ulcer with fluorescein to visualise the cornea.
   - Any spontaneous corneal defect (on staining with fluorescein) should be treated as an infectious corneal ulcer
   - Document the size and location with a sketch, as well as other eye findings eg conjunctival injection, presence of hypopion, pupil reaction etc.
   - Most cases will require admission to save the vision (only send home on treatment if really reliable patient/caregiver, living nearby to hosp)
   - Very severe cases/only eye/young patient suggest referral, associated hypopion or no response in 48h definitely refer.
Management:
- **AVOID steroids (including antibiotic/steroid combinations)!**
- **All cases:** Chloramphenicol ointment nocte
- **Mild cases:** Ciprofloxacin eye drops hourly until defect completely healed
- **Follow up with daily/every 2\textsuperscript{nd} day review to assess size & general condition of eye**
- **Severe cases:** Ciprofloxacin eye drops every 15min x2hrs, then hourly as above, discuss if concerned
- **Expect a clinical response in 24-48 hrs, if not consider infectious cause other than bacterial (fungal or viral) and refer.**
- **Dendritic pattern of ulcer + reduced sensation requires cover for Herpes Simplex Keratitis – also give Acyclovir ointment 5x/day x2/52 and r/v**
- **Add oral analgesics where necessary and nutritional supplements if malnourished**
- **Counsel the patient on the likelihood of a small scar which will affect future vision**

8. **Subconjunctival haemorrhage:**
   Reassure, conservative Mx

9. **Hyphema**
   If the hyphema is larger than 1/3 of the anterior chamber, already associated with raised IOP or not resolving in 1/52 : refer.

10. **Hypopyon**
    Signifies Infectious keratitis or endophthalmitis; needs referral

11. **Corneal abrasion:**
    Defect should heal within 48hrs
    Prescribe Chloramphenicol ointment BD to lubricate and prevent infection entering the eye.
    Cycloplegics (Homatropine BD) only if severe pain, 3days max
    Oral analgesics should suffice for most

**Causes and management of some other commonly seen conditions**

1. **Blepharitis**
   - This condition is commonly overlooked. Crusting at the eyelash bases and may even evolve into pre-septal cellulitis
   - Advise frequent "lid scrubs" with gauze/earbuds and half-strength baby shampoo,(available in our pharmacy) followed by application of Chloramphenicol ointment
   - Look out for misdirected lashes scratching the cornea, which can cause severe impairment if not epilated
2. **Pterigium and pingueculum**
   - Risk factors are UV exposure and dry climates
   - Commonly present with irritated eye
   - Advise avoiding contributing “weather conditions” by wearing hat &/sunglasses
   - Symptomatic treatment with lubricants eg Allergex gutt. BD (vasoconstrictor) and Spersatears PRN (lubrication) help with irritation or inflammation. Can use Chloro ointment nocte if bacterial infection.
   - Pterigiums will only qualify for surgery once they have grown over the pupil

3. **Conjunctival squamous cell carcinoma**
   - This condition more commonly seen in young adults with HIV; UV exposure and HPV are risk factors.
   - Clinically: may initially be difficult to distinguish from pingueculums but danger signs are 1 or more prominent “feeder vessels”, rapid growth, any bleeding and irregular appearance
   - Management: Refer for excision and local chemotherapeutics

4. **Corneal Scar/Opaque cornea**
   Although this always looks alarming, it very rarely demands urgent attention. Unfortunately, in most areas with longstanding poor access to eye services these eyes are a common finding and usually the result of previous corneal trauma or infections. Exclude/Rx current infection and counsel on lack of available solution in government setting, as well as importance of protecting the other eye.

5. **Lid laceration**
   Refer all lacerations involving the lacrimal drainage apparatus, levator aponeurosis or associated penetrating eye injury
   For simple lacerations consult the very detailed suturing guidelines in the Family Medicine Handbook
Sexual Assault

Summary
The unfortunate phenomenon of sexual abuse is still regularly encountered. Apart from obvious presentations such as rape victims being brought in by the police, be alert to the possibility of sexual abuse in children presenting with genital injury, STI or psychological or behavioural issues.

History
Be sensitive in history taking. Explain the process that will be followed.

Examination
- Find out where the “rape kit” exam for evidence collection is performed in your area. It’s usually by the local hospital, but might be at a Rape Crisis Centre if there is one. If so, the police should take the patient there as they are our responsibility from the time they present and should never be sent away.
- Before you send the patient conduct a full general examination to exclude other injuries.

Collecting evidence
- Consult someone with experience about how to collect the evidence and complete the J88 as it is beyond the scope of this handbook, but important!

Investigations
In addition to any investigations that may be necessitated by other injuries, all patients should have the following done and a plan made for following up results:
- HIV counselling and testing
- Syphilis serology
- Hepatitis B serology
- Pregnancy test

Medication
- Post exposure prophylaxis is effective in reducing the transmission rate of HIV, although has not been studied specifically in post-sexual assault. It should only be given to HIV negative individuals who present within 72 hrs of the incident. (PEP does not prevent infection if given later than this.) Use the same approach as in the Needlestick protocol (i.e. usually TLD)
- Where appropriate, emergency conception should be offered to the patient. (Levonorgestrol 1.5mg as a single dose within 72 hours.)

It is important to counsel patients about the side-effects of the medication and the importance of taking it correctly and completing the course.

Counselling
All patients who have suffered sexual assault should be referred for counselling. If this is not possible on presentation (e.g. after hours, or police responsible for transport), make a follow up appointment within a few days.

Follow up
- All patients should be followed up at one week and receive follow up counselling, ideally with psychologist, or OT/SW/Dr as available.
- All HIV negative and syphilis negative patients need to be retested at 6 weeks and 3 months, with appropriate further counselling.
**Palliative Care**

“Palliative care is an approach that improves the quality of life of patients and their families facing problems associated with life-threatening illnesses”. It requires a comprehensive assessment of the patient (and their family) considering their physical, psychosocial and spiritual (and any other) needs. Pain is the most common symptom we treat, but other symptoms are almost always present. Multi-disciplinary team involvement is imperative. There are almost always non-pharmacological interventions available that should be used either prior to, or alongside, drug interventions.

**Pain management**

- By the mouth, by the clock, by the ladder, for the patient

<table>
<thead>
<tr>
<th>Step</th>
<th>Medication</th>
<th>Co-analgesic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Panado +/- NSAID</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Panado +/- NSAID</td>
<td>Weak opioid</td>
</tr>
<tr>
<td>3</td>
<td>Panado +/- NSAID</td>
<td>STOP WEAK OPIOID</td>
</tr>
</tbody>
</table>

| NSAID = Ibuprofen/Diclofenac/Indomethacid |
| Weak opioid = Tramadol/Tilidine (paeds) |
| Strong opioid = Morphine |
| Co-analgesics include: steroids, antidepressants, anti-convulsants, NMDA-antagonists, anti-spasmodics, muscle relaxants |

**A quick guide to morphine:**

- Start with Mist Morphine 10mg q4h (if cachectic, elderly or HIV +ve start lower)
- Consider side effects; always prescribe lactulose (15ml dly)
- For nausea: Haloperidol 1.5mg nocte or Metoclopramide 10mg q8h for 5d
- Review pain daily and increase as needed
- Convert to controlled release as soon as stable (24 hour dose divided q12h)
- Breakthrough doses should be morphine syrup equivalent to the q4h dose
- Can be given po/IV/subcut. Avoid intramuscular administration

**Other non-pain symptoms:**

- Breathlessness
  - Assess cause (reversible cause (eg superimposed infection) or progression of disease
  - Non-pharmacological options (breathing techniques, positioning, PT, treat anxiety)
  - Pharmacological options (Nebs, short-acting benzodiazepine, morphine, oxygen)
- Cough: treat reversible cause. If none, consider codeine phos. 30mg q8h
- Hiccup: treat reversible cause (eg GORD) and if none, consider baclofen 5mg q8h or chloropromazine 25mg nocte
• Nausea and vomiting
  o Many possible causes. Non-pharmacological options include soft
  foods and frequent small meals (involve the dietician)
  o Dexamethasone can help if para-tumour inflammation is present
  o Haloperidol works well (start low dose) (IV formulation no longer
    available, so PO only)
• Anorexia/Cachexia: Dexamethasone 4mg dly or prednisone 10-20mg dly
  (effect lasts up to 4 weeks).
• Confusion: low doses of Haloperidol are safer than benzodiazepines
• Depression: have a low threshold for starting SSRIs (Citalopram is better
  than Fluoxetine)

**The terminal phase: the last 48 hours**
• Family counselling – the grief experience is significantly affected by good,
  ongoing counselling
• Reverse the reversible problems where possible. Ensure adequate analgesia
  and symptom control. As far as possible avoid invasive procedures. If the
  patient is tolerating oral feeds/meds continue with these. If not, a continuous
  subcutaneous infusion is nicer than an intravenous infusion. Intramuscular
  injections should be avoided altogether.
• Terminal sedation: Midazolam 5-10mg ± Clotiapine 20mg ± Morphine
  (depending on their tolerance) ± Hyoscine 20mg (helps with noisy breathing)
  down NGT, SC or IV, in that order, not IMI
• Do not resuscitate! But do discuss this with family and the patient where
  appropriate (and nursing staff) ahead of time.
**Blood Transfusions**

Please note the following important points about blood transfusions.

**General**
1. The nearest blood bank is in Mthatha. Cross-matched blood is generally not available over weekends or after hours. If you urgently need some, speak to the matron on duty about organising a driver.
2. Three units of fresh, uncross-matched O+ blood are kept on site and are available as emergency blood at all times. (The blood bank usually doesn’t issue us with O- blood.)
3. Emergency blood is kept in the fridge in theatre.
4. Where possible, any usage of emergency blood should be discussed with a senior colleague. The indications will vary from patient to patient and are beyond the scope of this protocol, but the risks of uncross-matched blood must be borne in mind by the prescriber.

**Guidelines for transfusion**
1. Do NOT do Type and Screen – not appropriate for DH; doesn’t speed up access. Do not tick “Emergency” either as takes just as long from Mthatha.
2. Packed red cells (Adults / Paediatrics)
   a. Symptomatic anaemia Hb <7g/dL
   b. Active bleeding, blood loss >15% of blood volume (based on 70ml/kg for adults)
   c. Hb <10g/dL and requiring chemotherapy
   d. Perioperative patient where post-operative Hb is predicted to be <8g/dL
3. Neonates
   a. Symptomatic anaemia Hb <7g/dL
   b. Hb <8g/dL requiring supplemental oxygen
   c. Hb <9g/dL requiring non-invasive ventilation (CPAP)
   d. Hb <10g/dL requiring mechanical ventilation
4. Platelet justification
   a. Platelet count <50,000 in a patient with active bleeding
   Giving platelets at a District Hospital is a waste of time unless you are needing to stop active bleeding and have a plan for transfer. Do not give elective transfusions, regardless of condition or advice. Rather refer.
5. Freeze-dried / Fresh Frozen Plasma
   a. Active bleeding with probable coagulation factor deficiency, pending PT/PTT
   b. Thrombotic thrombocytopenic purpura
   c. Warfarin toxicity

**Paperwork**
1. All blood usage must have a request form completed
   a. For emergency blood, a transfusion form (similar to the usual crossmatch request form) must be completed by the doctor involved. This is required by the blood bank before they will issue a
replacement unit. The forms are kept in theatre and match the pre-issued unit numbers. Please use the correct one.

2. Any emergency blood use should also be recorded on the “Record of Emergency Blood Usage” form – recording the patient’s details and the unit number. This form is kept on the notice board in the theatre duty room.

3. A “blood accountability form” must be completed for all units used or ordered, indicating the reason for the transfusion. At Zithulele this form is currently electronic. Please ask Ben for the link.

4. Blood transfusion monitoring (of vital signs and unit numbers) must be done on the specific form available in the wards for this purpose and left in the patient record.

Restocking blood
1. Please remind theatre staff to report emergency blood use and request more.
2. When blood is used, the oldest (unexpired) units should be used first to prevent blood expiring unused.

SANBS (“Blood bank”) contact details
Phone: 047-5323730
Fax: 047-5326060

Blood Transfusion formula for Children
(Hb desired – Hb now) x weight x 4 = quantity to transfuse (mls)

Give furosemide 1mg/kg if clinically necessary. Have a low threshold for giving furosemide to children with kwashiorkor who need transfusion.
Improvised Adult CPAP

In adult patients with severe respiratory distress for whom maximal oxygen therapy is not maintaining adequate oxygenation or increased work of breathing will likely result in respiratory failure AND when a ventilator is not available, improvised CPAP can be constructed. (See Zithulele-origin article here!) It should be used while awaiting transfer or if a patient is not accepted for transfer. Good candidates are patients with COPD, PCP, pulmonary oedema in the older CCF patient. As with any CPAP the patient must be alert and cooperative.

1. Find an anaesthetic mask (the type that is usually used for bag mask valve ventilation)
2. Remove the reservoir bag with the oxygen attachment from a non-rebreather mask and push it into the anaesthetic mask
3. Push the tubing from an underwater chest drain set into the same space next to the reservoir bag – it is a tight fit but this helps prevent leaks
4. Tape the tubes to the masks ensuring that there are no leaks
5. Cut the distal centimetre off the middle finger of an examination glove and position it at the distal end of the chest drain tubing so that the cut end extends about three centimetres past the end of the tube then tie it in position with the other fingers of the glove. This forms a one-way valve at the end of the chest drain tubing.
6. Fill the underwater chest drain bottle with water and place the tubing with the glove valve into the water. The depth of the tube under the water determines the amount of PEEP provided in mmH20.
7. Connect the oxygen to the inlet and turn the flow to 2 times the minute volume (7ml/kg x respiratory rate x 2)
8. Test the system by occluding the mask with your hand, there should be continuous bubbling from the underwater tube. Look for and seal any leaks.
9. Use a bandage to attach the mask firmly onto the patients face using a slipknot to allow quick and easy removal if required
Notifiable Medical Conditions

Thirty-three broad medical conditions are currently notifiable in South Africa. Some have been split into various components, resulting in over 45 distinct medical conditions.

They fall into two categories, based on how urgently they need to be notified to the authorities.

**Category 1** Notifiable Medical Conditions (NMC) are conditions that require immediate reporting by the most rapid means available upon clinical or laboratory diagnosis followed by a written or electronic notification to the Department of Health within 24 hours of diagnosis by health care providers.

**Category 2** NMCs are conditions that must be notified through a written or electronic notification to the Department of Health within 7 days of diagnosis by health care providers.

At Zithulele, it is the responsibility of the doctor making the diagnosis to complete the notification form, except for TB conditions, which are notified by TB Point. If you use the form (also available at www.zithulele.org/resources) you must email it to NMCsurveillanceReport@nicd.ac.za or fax it to 086 639 1638. Report it to the NMC Focal Person at sub-district via the Infection Control nurse. There is also an NMC app for Android, which makes it all a lot easier. Download from Google Play.

### Category 1

<table>
<thead>
<tr>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute flaccid paralysis</td>
</tr>
<tr>
<td>Acute rheumatic fever</td>
</tr>
<tr>
<td>Anthrax</td>
</tr>
<tr>
<td>Botulism</td>
</tr>
<tr>
<td>Cholera</td>
</tr>
<tr>
<td>Food borne illness outbreak &gt;4 pp</td>
</tr>
<tr>
<td>Malaria</td>
</tr>
<tr>
<td>Measles</td>
</tr>
<tr>
<td>Meningococcal disease</td>
</tr>
<tr>
<td>Plague</td>
</tr>
<tr>
<td>Poliomyelitis</td>
</tr>
<tr>
<td>Rabies (human) – not dog bite</td>
</tr>
<tr>
<td>Rift valley fever (human)</td>
</tr>
<tr>
<td>Smallpox</td>
</tr>
<tr>
<td>Viral haemorrhagic fever diseases*</td>
</tr>
<tr>
<td>Waterborne illness outbreak</td>
</tr>
<tr>
<td>Yellow fever</td>
</tr>
</tbody>
</table>

### Category 2

<table>
<thead>
<tr>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural or stock remedy poisoning</td>
</tr>
<tr>
<td>Bilharzia (schistosomiasis)</td>
</tr>
<tr>
<td>Brucellosis</td>
</tr>
<tr>
<td>Congenital rubella syndrome</td>
</tr>
<tr>
<td>Congenital syphilis</td>
</tr>
<tr>
<td>Diphtheria</td>
</tr>
<tr>
<td>Enteric fever (typhoid or paratyphoid)</td>
</tr>
<tr>
<td>Haemophilus influenza type B</td>
</tr>
<tr>
<td>Hepatitis A</td>
</tr>
<tr>
<td>Hepatitis B</td>
</tr>
<tr>
<td>Hepatitis C</td>
</tr>
<tr>
<td>Hepatitis E</td>
</tr>
<tr>
<td>Lead poisoning</td>
</tr>
<tr>
<td>Legionellosis</td>
</tr>
<tr>
<td>Leprosy</td>
</tr>
<tr>
<td>Maternal death (pregnancy, childbirth and puerperium)</td>
</tr>
<tr>
<td>Mercury poisoning</td>
</tr>
<tr>
<td>Pertussis</td>
</tr>
<tr>
<td>Soil-transmitted helminth infections</td>
</tr>
<tr>
<td>Tetanus</td>
</tr>
<tr>
<td>Tuberculosis: pulmonary or EPTB</td>
</tr>
<tr>
<td>Tuberculosis: MDR or XDR</td>
</tr>
</tbody>
</table>

Cases such as hepatitis, typhoid and congenital syphilis need to be confirmed before being notified. Acute flaccid paralysis is a clinical sign and should be notified as such regardless of cause.
Technology: Some Useful Apps And Clinical Decision Tools

Technology has changed the way we practice medicine. You probably already use a number of these apps, but if you don’t, your colleagues recommend these tools in addition to Google and Wikipedia ;)

Remember that it remains your responsibility to check doses and calculations that are done by apps. If something looks wrong, it might well be – bugs infect apps as well as people!

Guidelines
EM Guidance (SA app that collates multiple guidelines, including the NDOH EML/STG guides for Hospital and PHC level care, as well as HIV and TB guides)
SA HIV/TB Hotline (app)
Surviving Sepsis (website: www.survivingsepsis.org)
ECG aptitude (app)
iChart

Calculators
Qx Calculate
MedCalc
MD Calc
ObWheel

Tools
Snellen chart
Vula (for referrals)
Trakcare link: https://trakcarelabwebview.nhls.ac.za/trakcarelab/default.htm

References
Medscape
UpToDate
(requires subscription, but you can motivate through International Grant Programme at https://www.better-evidence.org)

Clinical Decision Tools (within apps)

<table>
<thead>
<tr>
<th>Helps with</th>
<th>Decision tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper GIT bleed</td>
<td>Glasgow Blatchford score</td>
</tr>
<tr>
<td>Head injury assessment</td>
<td>Canadian CT Brain</td>
</tr>
<tr>
<td>Paediatric head injury</td>
<td>Pecarn rule</td>
</tr>
<tr>
<td>Neck injury assessment</td>
<td>Canadian C-spine rule</td>
</tr>
<tr>
<td>Syncopage</td>
<td>San Francisco score</td>
</tr>
<tr>
<td>Decision re warfarin</td>
<td>HAS-BLED and CHAD2</td>
</tr>
<tr>
<td>Appendicitis diagnosis</td>
<td>Alvarado score</td>
</tr>
</tbody>
</table>

And if you need to scan anything for your records, or to email:
AdobeScan
The following guide to empiric antibiotic usage is included to try and standardise our approach to treating infections – and guide you when unsure. It is based on the updated EML. Please don’t deviate from this unless you have a good reason.

<table>
<thead>
<tr>
<th>Infection</th>
<th>Drug/s of choice</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Head and brain</strong></td>
<td></td>
</tr>
<tr>
<td>Meningitis (adults)</td>
<td>Ceftriaxone (Adults: 2g IV 12 hourly for ten days) (Look up specific treatment if organism confirmed)</td>
</tr>
<tr>
<td>Meningitis (children)</td>
<td>Ceftriaxone 50mg/kg/dose IV 12 hourly Add Ampicillin 50mg/kg/dose to cover Listeria if &lt;4m old In neonates, use Cefotaxime: 0-1 week: 50mg/kg IV 12 hourly 1-4 weeks: 50mg/kg IV 8 hourly</td>
</tr>
<tr>
<td>Brain abscess</td>
<td>Ceftriaxone 2g IV 12 hourly AND Metronidazole 400mg PO 8 hourly (500mg IV 8hrly if ↓LOC)</td>
</tr>
<tr>
<td>Neonatal conjunctivitis</td>
<td>Ceftriaxone 50mg/kg IV or IM stat Remember to treat mother and partner</td>
</tr>
<tr>
<td>Bacterial conjunctivitis</td>
<td>Topical chloramphenicol 6 hourly for 7 days</td>
</tr>
<tr>
<td>Pharyngitis / Tonsilitis</td>
<td>In-patients - Ampicillin Adults: 1g 6hrly IV Paed: 25-50mg/kg/dose 6hrly Out-patients Adults: Amoxyl 1g BD for 10d Paeds up to 11yr: PenVK 250mg 12hrly for 10 days</td>
</tr>
<tr>
<td>Otitis media</td>
<td>See protocol</td>
</tr>
<tr>
<td><strong>Chest</strong></td>
<td></td>
</tr>
<tr>
<td>Community acquired pneumonia (adults)</td>
<td>▪ Adults &lt; 65yr with no co-morbidity: First line treatment is Ampicillin IV 1g 6 hourly or oral Amoxyl 1g 8hrly  ▪ Adults &gt; 65yr or with co-morbidity incl. HIV: Ceftriaxone 2g daily IV UNTIL TEMP SETTLES. i.e. Change to Augmentin 1g PO BD once temp down  ▪ Severe pneumonia: (3 of: Confusion, Urea &gt; 7, RR &gt; 30, BP&lt;90/60, Age &gt; 65): Ceftriaxone 2g daily (then Augmentin PO) &amp; Azithromycin 500mg daily for 3 days See further details in ceftriaxone protocol</td>
</tr>
<tr>
<td>Pneumonia (children)</td>
<td>▪ If child requires admission, use: Ampicillin IV, 25-50mg/kg/dose 6 hourly plus Gentamycin IV, 6mg/kg as daily dose Then Augmentin PO (90mg/kg/day amoxyl) dosed TDS or BD depending on formulation, to complete 10d  ▪ If poor response: Change to Ceftriaxone IV, 80mg/kg/dose daily for 10 days Add Cloxacillin IV 50mg/kg/dose 6hrly if S. aureus possible (Alternative: Cefazolin 25mg/kg/dose 8 hourly)  ▪ If HIV exposed: see next page</td>
</tr>
</tbody>
</table>
## Infection

<table>
<thead>
<tr>
<th>Condition</th>
<th>Drug/s of choice</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chest cont</strong></td>
<td></td>
</tr>
<tr>
<td>Pneumonia (children) cont.</td>
<td>- If HIV exposed: Add PJP cover with Bactrim and steroids Consider viral / fungal / TB as cause Use Azithromycin 10mg/kg daily for 3 d to cover atypicals</td>
</tr>
<tr>
<td>PJP pneumonia (adults)</td>
<td>- Bactrim 3tabs (&lt;60kg) or 4 tabs (&gt;60kg) qid po for 21 d Use IV if vomiting / ↓LOC: 6 hrly dosing: &lt;60 kg 240/1200 mg; ≥60 kg 320/1600 mg If hypoxic, give prednisone 80mg/d for 5 days, 40mg/d x 5 d then taper Give folate to pt on high dose bactrim</td>
</tr>
<tr>
<td>PJP pneumonia (children)</td>
<td>- Cotrimoxazole IV/oral, 5mg trimethoprim/25mg sulpha /kg/dose 6 hourly for 21 days (NB IV needs dilution) Prednisone 1-2mg/kg daily for 7 days then taper over 7 days</td>
</tr>
<tr>
<td>Lung abscess</td>
<td>Augmentin 1.2g (25mg/kg/dose in paeds) 8hrly IV until temp settled x 24 hours then oral treatment (1g BD) for 4-6 wks.</td>
</tr>
<tr>
<td>Infective endocarditis</td>
<td>Send blood culture. Treat empirically if severe: Pen G / Ampicillin plus Gentamycin (1.5mg/kg BD) Duration depends on sensitivity – usually at least 4wks IV Add Cloxacillin 3g 6hrly OR Cefazolin 2g 8hrly if <em>S aureus</em></td>
</tr>
<tr>
<td><strong>Maternity</strong></td>
<td></td>
</tr>
<tr>
<td>C/S pre-op prophylaxis</td>
<td>Cefazolin IV stat (If &lt;60kg give 1g; if 60-100kg give 2g, if over 100kg give 3g) [There is a move towards adding Azithromycin 1g IV but this is not yet available to us.]</td>
</tr>
<tr>
<td>C/S post-op prophylaxis</td>
<td>Ampicillin 1g 6hrly IVI and Gentamycin 5mg/kg daily IVI and Metronidazole 400mg 8hrly orally for at least 48hrs where risk factors present</td>
</tr>
<tr>
<td>Puerperal sepsis</td>
<td>Empiric treatment in EML Hospital Level is Augmentin 1.2g IV 8 hourly Switch to oral Augmentin once apyrexial for 24 hours (Note: the EML for PHC suggests a single dose of Ceftriaxone and Metronidazole, but this is pre-hospital)</td>
</tr>
<tr>
<td>Chorioamnionitis</td>
<td>Ampicillin 1g 6hrly and Gentamycin 5mg/kg daily IVI plus Metronidazole 400mg 8hrly PO until delivery, with single IV dose after delivery (see full guideline)</td>
</tr>
<tr>
<td>PPROM prophylaxis (26w-33+6w)</td>
<td>Azithromycin 1g PO stat PLUS Ampicillin 2g 6hly IVI x 48h THEN Amoxicillin 500mg tds PO x 5/7, PLUS Metronidazole 400mg 8hrly PO.</td>
</tr>
<tr>
<td>Prelabour ROM &gt;18hrs at term</td>
<td>Ampicillin 1g IVI 6-hourly PLUS Metronidazole 400mg PO 8-hourly Avoid Augmentin</td>
</tr>
<tr>
<td><strong>Genitourinary</strong></td>
<td></td>
</tr>
<tr>
<td>Pyelonephritis</td>
<td>As for Complicated cystitis. If IV Rx needed, use Genta 6mg/kg, or Ceftriaxone 1g daily if impaired renal fxn. Switch to orals when possible</td>
</tr>
</tbody>
</table>
## Infection

### Genitourinary cont.

<table>
<thead>
<tr>
<th>Infection</th>
<th>Drug/s of choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cystitis</td>
<td><strong>Uncomplicated</strong></td>
</tr>
<tr>
<td></td>
<td>▪ Fosomycin, oral, 3g, single stat dose OR</td>
</tr>
<tr>
<td></td>
<td>▪ Gentamycin, IM, 5mg/kg, single stat dose OR</td>
</tr>
<tr>
<td></td>
<td>▪ Nitrofurantoin, oral, 100mg 6 hourly for 5d</td>
</tr>
<tr>
<td></td>
<td><strong>Complicated</strong></td>
</tr>
<tr>
<td></td>
<td>Ciprofloxacin 500mg BD for 7-10 days</td>
</tr>
<tr>
<td></td>
<td>[Note: there are emerging concerns re Cipro, esp in elderly, but the EDL still has it as first line here. Avoid with ACE-I]</td>
</tr>
</tbody>
</table>

**Costing note (Dec 2020):**
- Fosomycin: R120.77 per sachet;
- Nitrofurantion: R141.93 per 5 day course;
- Gentamicin: R6.47 per amp;
- Cipro: R15.72 for 10d

<table>
<thead>
<tr>
<th>UTI in pregnancy</th>
<th>Empiric treatment indicated when symptoms plus nitrites AND leucocytes on dipstix</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Always send MC&amp;S</td>
</tr>
<tr>
<td></td>
<td>▪ Fosomycin, oral, 3g, single stat dose OR</td>
</tr>
<tr>
<td></td>
<td>▪ Nitrofurantoin, oral, 100mg 6 hourly for 5d</td>
</tr>
</tbody>
</table>

| Prostatitis (with urethritis) | Ceftriaxone 250mg IM stat plus Azithromycin 1g PO stat Add Metronidazole 2g PO stat if partner has discharge |
| Prostatitis (no urethritis)   | Ciprofloxacin 500mg BD for 14 days                                                 |

| Genital ulcer (incl chancroid) | Benzathine Pen 2.4mu IM, stat plus Acyclovir 400mg BD if recurrent (esp if HIV positive) |
| Vaginal discharge              | PHC level: Azithromycin 1g PO stat plus Ceftriaxone 250mg IMI stat plus Metronidazole 2g PO stat |
|                               | If referred, and **persistent cervicitis confirmed, awaiting swab results:** Ceftriaxone 1g IM stat plus Azithromycin 2g PO stat Give metronidazole stat dose if not already given Remember Candida |

| PID Stage 1                   | Azithromycin 1g PO stat plus Ceftriaxone 250mg IMI stat plus Metronidazole 400mg PO BD for 7 days |
| PID Stage 2-4                 | Azithromycin 1g PO stat plus Ceftriaxone 1g IV daily plus Metronidazole 400mg PO 8 hourly UNTIL apyrexial CHANGE to Augmenting 1g PO BD till 10 days |

### GIT

<p>| Cholecystitis                | Augmentin 1g PO 12 hourly |
| H.pylori eradication         | Amoxycillin 1g BD for 14 days plus Metronidazole 400mg PO BD for 14 days plus Lansoprazole 30mg 12 hourly for 7d (DU) or 28d (GU) |
| Dysentery (empiric)          | Neonate: Cefotaxime IV 75mg/kg/dose 8 hourly for 5 days Infant: Ceftriaxone 50mg/kg IV daily for 5 days Child: Ciprofloxacin 15mg/kg/dose 12 hourly for 3 days Adult: Ciprofloxacin 500mg BD for 3d or 7d if comorbidity |
| Typhoid (children)           | Ceftriaxone 100mg/kg daily for 10-14 days; then, once stable: Cipro 15mg/kg/dose 12 hourly for 7-10 days |</p>
<table>
<thead>
<tr>
<th>Infection</th>
<th>Drug/s of choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infection</td>
<td>Basic Antibiotic Guide</td>
</tr>
<tr>
<td><strong>GIT (cont)</strong></td>
<td></td>
</tr>
<tr>
<td>Typhoid (adults)</td>
<td>Use Ceftriaxone 2g 12hrly until culture and sensitivities back. Use Ciprofloxacin 500mg BD for sensitive organisms. Treat until two negative weekly cultures, or for 4 weeks (6 weeks for chronic carriers)</td>
</tr>
<tr>
<td>Joints</td>
<td></td>
</tr>
</tbody>
</table>
| Open long bone fracture prophylaxis| Note: EML unclear. We follow SAASP guideline: \[
|                                  | If early (<5 hours) washout and debridement, provide prophylaxis with cefazolin 1g IV 8 hourly for 48 hours only. |
|                                  | If long delay to washout or significant contamination, treat with Co-amoxiclav 1.2g IVI 12 hourly for 5 days. |
| Paediatric dosing                 | Cefazolin 25mg/kg/dose (up to max dose of 1g) 8 hourly Augmentin IVI 30mg/kg/dose 8 hourly. |
| Open skull fracture               | Closed skull fractures do not require prophylaxis (even if CSF leak) Open depressed fractures (where meningeal damage possible) should receive Ceftriaxone 2g IV BD plus Metronidazole 400mg PO 8hrly for 5 days If open fracture of outer table only, can be managed as for long bone open fractures. |
| Septic arthritis / osteomyelitis  | Cloxacillin 2g IVI 6hrly OR Cefazolin 2g IVI 8hrly for 2 weeks THEN (if good response) Flucloxacillin 1g 6hrly for 2 weeks Consider Clindamycin 600 mg IV tds if severe, or penicillin allergic If urethritis or PID, give Ceftriaxone Infants 1-3months: Ceftriaxone 80mg/kg/dose 12hrly IVI Infants >3months: Cefazolin 25-50mg/kg/dose 8hrly IVI |
| Human and animal bites            | Augmentin 1g PO 12hrly for 5 days * NB Remember RABIES protocol |
| **Skin**                          |                                                                                  |
| Impetigo                          | Flucloxacillin 6 hourly for 5 days. Consider Povidone wash                        |
| Cellulitis & Erysipelas           | Cloxacillin 1g IV 6hrly OR Cefazolin 1g IVI 8hrly Change to Flucloxacillin 500mg 6hrly once improving Course for 5 to 10 days depending on response |
| Tick bite fever                   | Doxycycline 100mg 12 hourly for 7 days Pregnancy: Azithromycin 500mg BD for 3 days |
| Scabies                           | Please refer to page on Common Skin Conditions in the previous section          |

Note: In South Africa, Cloxacillin and Ampicillin are IV formulations; Flucloxacillin and Amoxycillin are their respective oral counterparts. Flucloxacillin is for the most part, interchangeable with cephalaxin if there is a stock-out.
“Special Antibiotics”

Wise use of all antibiotics will protect the future of our children. Nonetheless, in our context, we consider some antibiotics to be particularly “special antibiotics” (for a rural area). They need to be used judiciously, for reasons of cost, politics and resistance. Patients in need of them will otherwise need referral. At Zithulele, the use of these antibiotics requires discussion on the PTC Whatsapp group.

**Augmentin IV (Adults: 1.2g 8hrly IV)**
1. IV Augmentin is first line treatment for lung abscess and puerperal sepsis. This should be annotated on the chart and does not require authorisation. IV Augmentin for other purposes needs justification.

**Clindamycin (oral or IV; wide variety of doses, depending on indication)**
1. Lung abscess not responding to first line treatment
2. Quinsy not responding to penicillin
3. Osteomyelitis (if poor response to first line, or penicillin allergic)
4. Severe soft tissue infections.

**Meropenem (usual dose 500mg-1g 8hrly; paeds>3m: 20-40mg/kg 8hrly)**
1. With cultured organism with proven drug sensitivity, not susceptible to cheaper agents.
2. Occasional use in severe sepsis in Paeds or Neonates, not responding to first or second line antibiotics. Use higher-end dose in meningitis.
3. Needs dosing adjustment in renal failure

**Vancomycin (Usual dose 500mg IV 6hrly)**
1. With cultured MRSA with proven drug sensitivity.
2. Treatment of proven endocarditis in penicillin allergic patients.

**Piperacillin-Tazobactam (Usual dose 4.5g IV 6hrly)**
1. 3rd line antibiotic useful in respiratory, abdominal, skin and soft tissue infections
2. Requires cultures to aid drug choice
3. Use with aminoglycoside, unless guided by MC&S
4. Needs dosing adjustment in renal failure

Please check doses for children and in renal impairment etc. in SAMF or similar.

**Adverse Drug Reactions**

On the topic of drugs that can harm you… Please make the pharmacists very happy by reporting any adverse drug reaction. You do not need to know exactly which drug caused it.

The easiest way is via the EML app on your phone (unless you enjoy triplicate). If you use the email address zithuleleadrs@gmail.com instead of your own, we’ll be able to file a copy and correspond with SAPHRA if necessary.
Reminders About Ceftriaxone and Cefotaxime

Third generation cephalosporins are frequently indicated in the patients encountered at a rural hospital. It is important, nonetheless, that we ensure their use is rational to limit costs and prevent the emergence of resistance. Our primary third generation cephalosporin is Ceftriaxone. Dosing depends on indication.

Indications for ceftriaxone
(Remember that concurrent administration of calcium containing fluids is contraindicated together with ceftriaxone use.)

- **Bacterial Meningitis**
  - Better to use because good CSF penetration & broad spectrum cover
  - Ideally replaced by e.g. Pen when culture result, but not in our setting.

- **Pneumonia**
  - Please note SA Community Acquired Pneumonia Guidelines,
  - Although in our setting almost all patients qualify for Ceftriaxone (either severity or HIV infection), please ensure the following:
    - Proven HIV & Proven pneumonia
    - Consideration given to using Pen G if no signs of severity

- **Typhoid**
  - See Basic Antibiotic Guide table

- **Severe infections not responding to first line antibiotics**
  - Where five days treatment with first line antibiotic treatment has failed, or where indicated by culture results.

- **Hospital acquired infection**
  - If HAI is suspected use Ceftriaxone 2g daily and Amikacin 15mg/kg daily

Ceftriaxone not indicated
- Neonatal sepsis without meningitis.
  - Pen G and Gentamycin are the first line drugs for sepsis in neonates.
- Paediatric pneumonia.
  - Pen G is the first line treatment. Add Gentamycin if under 4 months old.
  - Add Co-trimoxazole if under 1 year old unless proven HIV negative.
- Malnutrition with oedema (“kwashiorkor”)
  - Pen G and Gentamycin are first line treatment. Use Cefotaxime if no response to these.

Indications for cefotaxime
- Cefotaxime can be used as an alternative to Ceftriaxone for most of the above indications. To minimise confusion, please try and limit its use to those occasions when Ceftriaxone is out of stock. Please remember that Cefotaxime requires twice a day dosing.

No stat doses of third generation cephalosporins
- The only STAT doses of Ceftriaxone in the hospital should be for prostatitis with urethritis, vaginal discharge syndrome and PID stages 1 & 2. Otherwise, stat doses should not be used. (This is different at clinic level where IMCI protocols call for the selective use of stat doses while awaiting transfer.)
Paediatric Prescribing: Some Pointers

Prescribing medication for children requires careful thought – it is important to ensure the correct dose (usually by weight), but also that the dose prescribed is possible, preferably easy, to give. This depends on the formulation and concentration of the medication. This section is intended as a reminder of the concentrations of drugs used commonly in paediatrics and to help the medical staff prescribe appropriate doses of commonly used medications in quantities that are relatively straightforward for the nurses to administer. If you are unsure about whether a dose is doable, please check with a pharmacist. And always check that the nursing staff are happy with (and can read) what you have written.

ANTIBIOTICS vial and capsule sizes for paeds
Amoxicillin syrup 125mg/5ml; capsules are 250mg or 500mg
Ampicillin 250mg or 500mg ampules
Augmentin syrup comes in 125mg/5ml or 250mg/5ml
Azithromycin syrup 200mg/5ml or 500mg tablets
Cefazolin vials of 1g
Ceftriaxone vials of 250mg, 500mg, 1g
Ciprofloxacin syrup is 50mg/ml, tablets are 500mg/tab
Flucloxacillin syrup 125mg/5ml; capsules are 250mg or 500mg
Gentamycin 20mg/ml (beware adult vials: 80mg/ml)
Pen G (benzyl) vials of 1mu or 5mu

ANALGESIA
Panado Syrup 120mg/5ml - 15mg/kg 6 hourly (consult SAMF for neonatal dosing)
Brufen Syrup 100mg/5mls – 5mg/kg 8 hourly (Avoid in children <7kg or <6 months)
Valaron drops 1 drop per 2.5kg weight – round down

ANTI-HELMINTHICS
Albendazole 200mg/tab  <2 years  200mg stat;  >2 years 400mg stat
Mebendazole 500mg/tab or 100mg/tab  500mg PO stat or 100mg BD for 3 days

ANTI-EPILEPTICS
Sodium Valproate - Syrup 200mg/5ml, CR tabs 200mg, 300mg or 500mg
5mg/kg/dose 8-12 hourly, increase to 15-20mg/kg/dose 8-12 hourly
Maximum 40mg/kg/day
Lamotrigine discuss with an experienced paeds doctor before using in kids
Phenobarbitone 20mg/5ml 3-5mg/kg/day nocte

ANTI-FUNGALS
Terbinafine 250mg tab  <25kg: 125mg; 25-35kg: 187.5mg; >35kg: 250mg
Fluconazole 10mg/ml suspension (35ml bottle), 50mg or 200mg capsules
General Anaesthesia: A Very Basic Guide

There is a YouTube channel dedicated to District Hospital Anaesthesia, created by KZN DCST Anaesthetist Prof David Bishop. It’s highly recommended. Check out https://www.youtube.com/channel/UC5RyvotEzpF1K6YozpKUgAw

Pre-operative checks

<table>
<thead>
<tr>
<th>Anaesthetic machine</th>
<th>Patient</th>
<th>Airway check</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxygen</td>
<td>Airway</td>
<td>Laryngoscope present and working</td>
</tr>
<tr>
<td>Halothane (sufficient, secure, adjustable)</td>
<td>Respiratory system</td>
<td>Magills forceps</td>
</tr>
<tr>
<td>Circuit (valves, leaks)</td>
<td>CVS</td>
<td>Guedell airway</td>
</tr>
<tr>
<td>Ventilator (settings, leaks)</td>
<td>Mental state</td>
<td>ETT</td>
</tr>
<tr>
<td>Manual ventilation</td>
<td>Last oral intake</td>
<td>Correct size mask</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ambubag</td>
</tr>
</tbody>
</table>

Rapid sequence induction

- Pre-op: fentanyl 1-2mcg/kg
- Preoxygenate
- Induction agent
  - Propofol 2-2.5mg/kg
  - Ketamine 1-2kg/kg IV
- Cricoid pressure
- Suxamethonium
  - 1mg/kg
- Intubate
- Bag-mask ventilate
- Check tube placement
- Position head, Secure tube and check placement again
- Continue ventilating
- Turn on volatiles / proceed with TIVA
- Remember opioid analgesia
  - Morphine 0.1mg/kg IV
- NDMR (atracurium 0.5mg/kg, then 0.1mg/kg every 15 min) for longer cases requiring relaxation

It’s worth being familiar with Difficult Airway algorithms. They’re not easy to look up in a panic! Check out www.openairway.org/algorithms

Keep an eye on
Pulse, BP, ECG, SpO₂, ETCO₂, Blood loss, Fluid intake

Waking the patient up

- Reversal if needed
  - Neostigmine 0.08mg/kg
  - Glycopyrrolate 0.2mg per mg of neostigmine
- Remove gases, give high flow O₂
- Encourage respiratory drive (manage CO₂)
- Extubate once opening eyes and eyes central
- Watch for hypoxia or apnoea post intubation
**Safe Spinal Anaesthesia**

There is a YouTube channel dedicated to District Hospital Anaesthesia, created by KZN DCST Anaesthetist Prof David Bishop. It’s highly recommended. Check out [https://www.youtube.com/channel/UC5RyvotEzpFIKFYozpKUqAw](https://www.youtube.com/channel/UC5RyvotEzpFIKFYozpKUqAw)

**Pre-operative checks**
- These are the same as for General Anaesthesia (see above). If you are doing a spinal, you must be prepared for, and able to do, a General.
- Ensure emergency drugs are available in theatre before you proceed.
- 2 IV access points ideal, minimum 18G cannula

**Drugs and amounts**
- Use 1.9ml heavy bupivacaine PLUS 0.2ml (10mcg) fentanyl
- If heavy macaine is out of stock, you can mix your own as follows:
  - Add 0.6ml 50% Dextrose to 4ml plain Macaine
  - Draw 2.1ml of this solution into syringe
  - Add 0.2ml Fentanyl
  - Therefore, total 2.3ml solution
  - NB. Sterility throughout this mixing procedure
- Keep diluted phenylephrine available in fridge (1 amp in 200ml normal saline is 50mg:1 mix). Draw up 10ml and give in 1-2ml boluses as needed. You can also put up to 10ml in a litre of fluid and run it.
- For uterine contraction once the baby is delivered, give oxytocin **2.5iu IV** and **7.5iu IM** into the deltoid.

**Monitoring**
- BP (q1m)/ Pulse / Sats = bare minimum
- ECG gold standard (but electrodes sometimes short stocked)

**Failed spinal**
- Causes:
  - Wrong place (patient position is more than half the battle)
  - Wrong drug/dose/volume/time
  - Bad batch (not a one-off failed spinal)
- What to do?
  - Can repeat spinal (wait 15m)
  - Open new ampoule of bupivicaine
  - Beware of high spinal
  - If you suspect batch failure, inform pharmacy

**High spinal?**
It is important to distinguish between
- **spinal hypotension** –
  - rapid decrease in systolic blood pressure due to vasodilation
  - happens commonly,
  - prevent with preload,
  - manage with vasopressors
  - may still require intubation if patient loses consciousness
• **true high spinal**
  - the level of motor block compromises cardiovascular and respiratory function.
  - Recognise ascending loss of function:
    - T1-T4: cardiac sympathetic fibres blocked resulting in bradycardia and severe hypotension
    - C6-C8: Tingling of hands and arms, weakness, affects accessory respiratory muscles
    - C3-C5: shoulder weakness a warning sign of impending diaphragmatic compromise (which requires intubation), slurred speech and LOC
• Click [here](#) for an excellent summary and algorithm if you want to read more.
Safe Sedation Reminders

The rural casualty (or ward!), as with most Emergency Centres, sees a variety of patients who need sedation in order to tolerate an unpleasant procedure. Even experience practitioners should refresh their knowledge by reading this helpful guide published in the SAMJ: http://www.samj.org.za/index.php/samj/article/view/4418/3130

1. Choose the patient appropriately:
   - Avoid sedating patients with known facial, dental or airway abnormalities
   - Take caution in patients with head injury, reduced GCS, or who are drunk
   - Ensure you assess patient with respiratory or cardiac conditions carefully
   - Consider regional anaesthetic as an alternative

2. Take consent

3. Ensure proper equipment
   - Oxygen and oxygen tubing must be in the room
   - Resuscitation trolley nearby and not in use currently
   - Vital signs monitor – SpO2 mandatory, BP important if older or unwell or if seeking deeper sedation
   - Ensure IV access
   - Take consent

4. Fasting?
   - Patients do not all need to be fasted but assess (and document) each patient in terms of risk and benefits. Patients who are actively vomiting, or at risk of it (esp head injury / post alcohol ingestion) are high risk

5. Staffing and observations
   - Two professionals must be in the room – at least 1 doctor and 1 nurse
   - Once procedure is over, patient must be monitored by a nurse until discharge criteria are met. the importance of continuous vigilant monitoring must be emphasised to the nurse who must sit with the patient until they start waking up.

6. Drugs
   - We use Ketamine, Midazolam, Fentanyl and Morphine most regularly. Propofol and Etomidate can be used if you have experience.
   - Draw up and label drugs properly
   - Give drugs in small incremental doses at least 2 minutes apart
   - Give analgesics before sedative agents if possible
   - Have an idea of your target ranges based on patient age, level of debilitation, drug combination you’re using, tolerance and pulmonary reserve.
7. Discharge criteria
   - Vital signs and consciousness returned to pre-sedation level
   - Oxygen saturation at pre-sedation levels without supplementation
   - Nausea, vomiting and pain controlled
   - Accompanied by a responsible adult with safe plan to get home

Drug doses for sedation

<table>
<thead>
<tr>
<th>Drug</th>
<th>Route</th>
<th>Dose</th>
<th>Onset of action</th>
<th>Time to peak effect</th>
<th>Duration of action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ketamine</td>
<td>PO</td>
<td>4-6mg/kg as single agent; 2mg/kg if used with other sedatives</td>
<td>&gt;5 min</td>
<td>30min</td>
<td>4-6 hrs*</td>
</tr>
<tr>
<td></td>
<td>IV</td>
<td>0.5-1mg/kg</td>
<td>&lt;1min</td>
<td>3-5min</td>
<td>5-10min*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Titrate to effect, repeating dose every 10 min as needed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IM</td>
<td>2-4mg/kg</td>
<td>2-5min</td>
<td>20 min</td>
<td>30-120 min*</td>
</tr>
<tr>
<td>Midazolam</td>
<td>PO</td>
<td>0.25-0.5mg/kg</td>
<td>10-30 min</td>
<td>60 min</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Buccal</td>
<td>0.25-0.3mg/kg</td>
<td>10-15 min</td>
<td>20-60 min</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IV</td>
<td>0.05-0.1mg/kg to max bolus of 2mg</td>
<td></td>
<td>3-5 min</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Titrate to effect, repeating dose every 10 min as needed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Propofol</td>
<td>IV</td>
<td>Bolus 0.5mg/kg over 3-5min</td>
<td>45-90 sec</td>
<td></td>
<td>5-8min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Repeat doses 0.5mg/kg Titration interval 1 min</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Further notes on ketamine

* The duration of action of ketamine is prolonged if administered with other sedatives or analgesics

“Ketafol” is a combination of ketamine and propofol. Synergism between the drugs allows lower doses of both drugs, reducing side effects.

Ketofol can be prepared in a 1:1 ratio (10mg/ml ketamine and 10mg/ml propofol in the same syringe, making the solution 5mg/ml of ketamine and 5mg/ml propofol) A 70kg patient can be given a bolus of 3ml over 1-2min. This should provide analgesia and sedation for 10-15 minutes.

Contraindications for ketamine are hypertension, cardiac failure, recent MI, history of cerebrovascular disease, cerebral trauma, raised intracranial pressure, raised intraocular pressure or open eye injury, acute psychiatric disease, thyrotoxicosis
Sedation for the intubated patient

An intubated patient awaiting transfer, or on occasion who is in the ward, usually needs further sedation.

Bolus approach
For short periods of time, a bolus approach is often adequate.
Use Morphine 1-2mg IV as needed AND Midazolam 1-2 mg IV as needed
If refractory, or needing sedation for longer periods, consider infusion

Infusion approach
Infusion requires a rate minder (infusion pump or syringe driver)
A combination of morphine and midazolam usually works best and is sufficient.

1. Take a 200ml bag of normal (0.9%) saline.
2. Remove 15ml.
3. Add 50mg morphine (our amps are 10mg/ml, so five amps)
4. Add 50mg midazolam (10ml of 3mg/ml concentration)
5. Starting dose is 0.05mg/kg/hr of morphine and 0.1mg/kg/hr of midazolam. At this concentration, take weight divided by 5 giving you ml/hr. (e.g. 50kg patient starts at 10ml/hr of this solution.)
6. Titrate rate up, to effect.
7. The maximum dose is 8 times the starting dose (0.4mg/kg/hr of morphine)
8. If further sedation is needed, the concentration of midazolam can be doubled or the morphine halved as the maximum dose of midazolam is 20 times the starting dose.

Adrenaline infusion
Adrenaline infusions can be as simple as putting 4, 8 or even 16 amps of adrenaline in a 200ml bag of normal (0.9%) saline and running to effect, but if you need to do it more precisely and have time to think, create a 200µg/ml solution by mixing 4ml of 1:1000 (1mg) adrenaline with 16ml of normal saline and putting it in a 20ml syringe. Then run it using this table, which shows ml/hour

<table>
<thead>
<tr>
<th>µg/kg/min</th>
<th>Weight</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
<th>110</th>
<th>120</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.05</td>
<td>0.6</td>
<td>0.75</td>
<td>0.9</td>
<td>1.05</td>
<td>1.2</td>
<td>1.35</td>
<td>1.5</td>
<td>1.65</td>
<td>1.8</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>1.2</td>
<td>1.5</td>
<td>1.8</td>
<td>2.1</td>
<td>2.4</td>
<td>2.7</td>
<td>3</td>
<td>3.3</td>
<td>3.6</td>
<td></td>
</tr>
<tr>
<td>0.2</td>
<td>2.4</td>
<td>3</td>
<td>3.6</td>
<td>4.2</td>
<td>4.8</td>
<td>5.4</td>
<td>6</td>
<td>6.6</td>
<td>7.2</td>
<td></td>
</tr>
<tr>
<td>0.3</td>
<td>3.6</td>
<td>4.5</td>
<td>5.4</td>
<td>6.3</td>
<td>7.2</td>
<td>8.1</td>
<td>9</td>
<td>9.9</td>
<td>10.8</td>
<td></td>
</tr>
<tr>
<td>0.4</td>
<td>4.8</td>
<td>6</td>
<td>7.2</td>
<td>8.4</td>
<td>9.6</td>
<td>10.8</td>
<td>12</td>
<td>13.2</td>
<td>14.4</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>6</td>
<td>7.5</td>
<td>9</td>
<td>10.5</td>
<td>12</td>
<td>13.5</td>
<td>15</td>
<td>16.5</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>0.6</td>
<td>7.2</td>
<td>9</td>
<td>10.8</td>
<td>12.6</td>
<td>14.4</td>
<td>16.2</td>
<td>18</td>
<td>19.8</td>
<td>21.6</td>
<td></td>
</tr>
<tr>
<td>0.7</td>
<td>8.4</td>
<td>10.5</td>
<td>12.6</td>
<td>14.7</td>
<td>16.8</td>
<td>18.9</td>
<td>21</td>
<td>23.1</td>
<td>25.2</td>
<td></td>
</tr>
<tr>
<td>0.8</td>
<td>9.6</td>
<td>12</td>
<td>14.4</td>
<td>16.8</td>
<td>19.2</td>
<td>21.6</td>
<td>24</td>
<td>26.4</td>
<td>28.8</td>
<td></td>
</tr>
<tr>
<td>0.9</td>
<td>10.8</td>
<td>13.5</td>
<td>16.2</td>
<td>18.9</td>
<td>21.6</td>
<td>24.3</td>
<td>27</td>
<td>29.7</td>
<td>32.4</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>12</td>
<td>15</td>
<td>18</td>
<td>21</td>
<td>24</td>
<td>27</td>
<td>30</td>
<td>33</td>
<td>36</td>
<td></td>
</tr>
</tbody>
</table>
Poisoning: Tank Pills
Ingesting a tank pill is a distressingly common, and usually very effective, method of attempting suicide. The tablet, which is used to fumigate maize storage tanks and is obtained over the counter at most local stores, contains aluminium phosphide, which is converted to phosphine gas, which rapidly causes profound multi-organ failure.

If you see a patient shortly (esp < 1 hr) after ingestion:
- Ensure airway protection, with early intubation if necessary
- Pass a NGT and lavage the stomach through it
- Give activated charcoal (potassium permanganate is ideal but not available) and Coconut Oil. Coconut oil may be effective even 6 hrs after ingestion.
- Give aggressive intravenous fluid using Ringer's lactate to counteract hypotension and increase renal filtration. Use furosemide if blood pressure allows, to prevent fluid overload. Aim for urine output of at least 2ml/kg/hour.
- Sodium bicarbonate sometimes helps improve mortality in severe acidosis
- MgSO4 may help counteract free-radicals and prevent cardiac arrhythmias. Try 2 g over 30 minutes followed by 5 g over the next 12 hours.

Unfortunately, mortality is high despite resuscitation efforts (studies report 36-100%). Death is usually from cardiac arrhythmia, refractory shock or severe acidosis. There is no point in transferring these patients.

For further info, this article is very helpful:
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3162709/

Poisoning: Amitraz
Amitraz is commonly used as an insecticide / insect repellant for animals and is one of the more popular substances to drink as a para-suicide. Amitraz is an α2 adrenergic agonist and its main symptoms are: CNS depression (drowsiness, coma, and convulsion), miosis, or, rarely, mydriasis, respiratory depression, bradycardia, hypotension, hypertension, hypothermia or fever, hyperglycemia, polyuria, vomiting, decreased gastrointestinal motility, and intestinal distension. Onset of action is reportedly 5-180 minutes, but up to six hours is also reported. The proposed lethal dose is 200 mg/kg.

Amitraz or organophosphate poisoning?
Shared features:
- miosis, bradycardia, hypotension
- history of possible insecticide poisoning.

Amitraz only:
- hyperglycemia, hypothermia, and reduced gastrointestinal motility
- If you have access to doing cholinesterase levels, they are normal
- Less reliable, a solvent smell or mothball like smell

OP poisoning:
- cholinesterase levels low
• fasciculations and a hypersecretory state (salivation, lacrimation, perspiration, and diarrhea)
• described as a garlicky odour.

Management is supportive and symptomatic.
1. Monitor respiratory, cardiac and CNS systems in hospital for 24 hours
2. Give oxygen. Support the blood pressure and perfusion by administering fluids and/or vasopressors as necessary
3. Manage seizures with diazepam or lorazepam
4. Use atropine only if the bradycardia is symptomatic or the patient unconscious
5. Gastric lavage is controversial. Do if the dose is massive, but intubate first to avoid aspiration or inhalation pneumonitis
6. Activated charcoal may help

References
Yilmaz H, Yildizdas D, Amitraz poisoning, an emerging problem: epidemiology, clinical features, management, and preventive strategies. Archives of disease in childhood

Poisoning: Gastric lavage and charcoal
Gastric lavage
• Gastic lavage is seldom effective, unless done within an hour of ingestion. (May be longer if the substance delays gastric emptying.
• Do NOT do gastric lavage if corrosive substances or volatile substances (eg paraffin) have been ingested
• Protect airway if the patient has a decreased level of consciousness

Activated charcoal
• Charcoal may reduce systemic absorption. Best done within an hour of ingestion.
• Repeated doses (50g 4-hourly) valuable in carbamazepine, dapsone, phenobarbitone or theophylline overdose
• No value in charcoal for strong acids or bases, corrosive substances, iron, lead, mercury, petroleum products, methanol, ethanol, ethylene glycol
• Dose: 50g (36 level teaspoons) diluted progressively in 300ml water

Poisoning: Hotlines
The www.afritox.co.za website has a comprehensive database of toxins. Get the Zithulele login from the Clinical Manager. Other hospitals: apply for one!

Have a low threshold for calling this national hotline (0861 555 777) for more information about managing a poisoning case, or help detecting what poison it might be. There is also good guidance for many overdoses in the EML/STG apps.
Anti-Coagulation

Patients admitted to hospital (especially medical wards) are at high risk of venous thromboembolism. Prevention is better than cure, for both DVT and obviously Pulmonary embolism (up to 15% of deaths in a medical ward are thought to be PE related).

At Zithulele we have a formal risk assessment tool, but all patients who have reduced mobility as well as HIV, TB or cancer are at especially high risk.

If you have on-site INR testing and access to enoxaparin, this is an area in which we can provide almost gold-standard care, but even without a tool, INR and enoxaparin, preventing VTE is possible.

Prophylaxis with enoxaparin
LMWH (enoxaparin) and unfractionated heparin work out as nearly cost equivalent once disposables and nursing time are considered. We have therefore chosen to use Enoxaparin 40mg daily as our prophylaxis of choice for all patients who qualify. (Be aware of the contraindications: active bleeding, renal insufficiency, coagulopathy, uncontrolled hypertension, LP within 12 hours.)

Treatment with enoxaparin
Treatment of a proven proximal DVT or pulmonary embolism should be with Enoxaparin 1mg/kg 12 hourly. Treatment dose should trigger warfarinisation unless contraindicated.

Plan B
For places / times when INR turnaround time is >24hrs or only unfractionated heparin available, the following approach seems prudent and is backed by evidence.

Prophylaxis
Use unfractionated heparin 5000u subcutaneously BD or TDS until mobility improves

Treatment of DVT
If you are sure of the diagnosis and feel the DVT needs treatment (usually above the knee) then use unfractionated heparin subcutaneously as follows:
- Loading dose of 333u per kg (use 25000u/ml concentration)
- Twelve hours later commence maintenance therapy of 250u per kg BD
- If you plan to warfarinise (see below) start this using the appropriate approach and stop heparin once INR > 2

Reminders about Warfarin
1. Anti-coagulation has significant associated risks even when done well. (7 major bleeds and 1 death per 100 patient years.) Patient selection in terms of risk-benefit analysis as well as ease of access to hospital is therefore very important. The CHAD2 and HASBLED scores are useful to help quantify risks.
2. Using a validated normogram for initiating and maintaining warfarin increases time in the therapeutic range.
3. If using drugs which interact with warfarin, increased monitoring is mandatory
4. Warfarin and heparin treatment must overlap for at least five days when warfarin is first initiated.

5. Target INRs are:
   a. For most: 2-3
   b. For mechanical valves 2.5-3.5

**Initiating warfarin**

**Option 1 – High risk patients**
Use in elderly, debilitated, malnourished, heart disease, liver disease, increased risk of bleeding or patients taking medication known to affect INR
Start with 2.5mg daily for 2 days, Day 3 INR, then adjust

**Option 2 – suitable for most patients**
Start with Warfarin 5mg for 2 days, Day 3 INR then adjust as per table

<table>
<thead>
<tr>
<th>INR</th>
<th>Dose (mg)</th>
<th>INR</th>
<th>Dose (mg)</th>
<th>INR</th>
<th>Dose (mg)</th>
<th>INR</th>
<th>Dose (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1.5</td>
<td>5 – 10</td>
<td>&lt; 1.5</td>
<td>10</td>
<td>&lt; 1.5</td>
<td>10</td>
<td>&lt; 1.5</td>
<td>7.5–12.5</td>
</tr>
<tr>
<td>1.5–1.9</td>
<td>2.5 – 5</td>
<td>1.5–1.9</td>
<td>5 – 7.5</td>
<td>1.5–1.9</td>
<td>7.5–10</td>
<td>1.5–1.9</td>
<td>5 – 10</td>
</tr>
<tr>
<td>2 – 3</td>
<td>0 – 2.5</td>
<td>2 – 3</td>
<td>0 – 5</td>
<td>2 – 3</td>
<td>0 – 5</td>
<td>2 – 3</td>
<td>0 – 7.5</td>
</tr>
<tr>
<td>&gt; 3</td>
<td>0</td>
<td>&gt; 3</td>
<td>0</td>
<td>&gt; 3</td>
<td>0</td>
<td>&gt; 3</td>
<td>0</td>
</tr>
</tbody>
</table>

**Option 3**
Use in younger, low bleed risk patients
May achieve therapeutic INR faster

<table>
<thead>
<tr>
<th>Day 3 INR</th>
<th>Day 3 &amp; 4 dose (mg)</th>
<th>Day 5 INR</th>
<th>Day 5, 6 &amp; 7 dose (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1.3</td>
<td>15, 15</td>
<td>&lt; 2</td>
<td>15, 15, 15</td>
</tr>
<tr>
<td></td>
<td>2 – 3</td>
<td>7.5, 5, 7.5</td>
<td></td>
</tr>
<tr>
<td>1.3 – 1.4</td>
<td>10, 10</td>
<td>3.1 – 3.5</td>
<td>0, 5, 5</td>
</tr>
<tr>
<td></td>
<td>&gt; 3.5</td>
<td>0, 0, 2.5</td>
<td></td>
</tr>
<tr>
<td>1.5 – 1.6</td>
<td>10, 5</td>
<td>&lt; 2</td>
<td>7.5, 7.5, 7.5</td>
</tr>
<tr>
<td></td>
<td>2 – 3</td>
<td>5, 5</td>
<td></td>
</tr>
<tr>
<td>1.7 – 1.9</td>
<td>5, 5</td>
<td>3.1 – 3.5</td>
<td>2.5, 2.5, 2.5</td>
</tr>
<tr>
<td></td>
<td>&gt; 3.5</td>
<td>0, 2.5, 2.5</td>
<td></td>
</tr>
<tr>
<td>2 – 2.2</td>
<td>2.5, 2.5</td>
<td>&lt; 2</td>
<td>5, 5, 5</td>
</tr>
<tr>
<td></td>
<td>2 – 3</td>
<td>2.5, 2.5, 2.5</td>
<td></td>
</tr>
<tr>
<td>2.3 – 3</td>
<td>0, 2.5</td>
<td>3.1 – 3.5</td>
<td>0, 2.5, 0</td>
</tr>
<tr>
<td></td>
<td>&gt; 3.5</td>
<td>0, 0, 2.5</td>
<td></td>
</tr>
<tr>
<td>&gt;3</td>
<td>0, 0</td>
<td>&lt; 2</td>
<td>2.5, 2.5, 2.5</td>
</tr>
<tr>
<td></td>
<td>2 – 3</td>
<td>2.5, 0, 2.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.1 – 3.5</td>
<td>0, 2.5, 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt; 3.5</td>
<td>0, 0, 2.5</td>
<td></td>
</tr>
</tbody>
</table>
Frequency of monitoring
Week 1: Day 3 & 5.
Week 2: 2 INRs, then weekly until INRs stable for 2 weeks, then 2-weekly until stable for one month, then monthly
Check INR 4-6 days after changing dose of drug which affects INR

Management of sub- or supra-therapeutic INRs
1. Emergency management if bleeding or signs of stroke
2. If INR > 10: hold warfarin, give vit K 5mg, decrease weekly warfarin dose by 20% and resume once INR therapeutic. Re-check INR in 2 days
3. If INR low, consider bridging LMWH if patient at high risk of clot
4. Identify cause:
   a. Transient: missed / extra dose, gastroenteritis, antibiotics, increased alcohol use
   b. Permanent: lifestyle change, change in chronic meds

Maintenance strategy
Use this validated normogram

<table>
<thead>
<tr>
<th>Target INR 2 - 3</th>
<th>Action</th>
<th>Target INR 2.5 – 3.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1.5</td>
<td>Extra dose, ↑weekly dose by 10-20%</td>
<td>&lt; 2</td>
</tr>
<tr>
<td>1.5 – 1.9</td>
<td>↑weekly dose by 5-10%</td>
<td>2 – 2.4</td>
</tr>
<tr>
<td>2 – 3</td>
<td>No change</td>
<td>2.5 – 3.5</td>
</tr>
<tr>
<td>3.1 – 3.5</td>
<td>↓weekly dose by 5-10%</td>
<td>3.6 – 4</td>
</tr>
<tr>
<td>3.6 – 4.9</td>
<td>Hold 1 dose, ↓weekly dose by 10-20%</td>
<td>4.1 – 4.9</td>
</tr>
<tr>
<td>5 – 9</td>
<td>Hold 2 doses, ↓weekly dose by 10-20%</td>
<td>5 – 9</td>
</tr>
<tr>
<td>&gt; 9</td>
<td>Urgent evaluation</td>
<td>&gt; 9</td>
</tr>
</tbody>
</table>

Do not adjust warfarin dose based on 1 asymptomatic, unexplained out-of-range maintenance INR ≤0.5 ±target. Recheck INR in 1-2 weeks

Duration of warfarin therapy
Definitive advice is hard to find. These rules of thumb are useful.

Transient risk factors underlying DVT
- Pregnancy, TB, AIDS, immobility
- Treat for three to six months

Unresolving risk
- PE, IVC, AF, mechanical valve, cancer
- Recurrent unprovoked DVT
- Lifelong treatment

Advice on initiating and monitoring is taken from www.rxlist.ca which is hereby acknowledged
Iron Made Easy!

This is a very brief guide intended to provide some reminders about treating iron-deficiency anaemia and to eliminate confusion about the different formulations of iron.

**Some reminders about anaemia**

- Normal haemoglobin varies with age and sex. (Remember, especially, the physiological nadir at about 6 weeks of age.)
- Not all anaemia requires transfusion – especially anaemia of chronic disease. Very low HBs in relatively asymptomatic patients will respond markedly if the underlying problem is treated.
- Consider the cause (iron deficiency, blood loss, haemolysis, folate or Vit B12 deficiency, malabsorption etc.) before treating. If no response to iron (indicated by a rising reticulocyte count) then consider one of the other causes.
- Remember to exclude or treat sepsis before initiating iron therapy
- Once the HB has been corrected, iron therapy should be continued for another 3 months to replace body stores.
- Children have a high incidence of anaemia, especially between 6 months and 2 years. In older children it is important to treat for parasitic intestinal infestation.
- Important drug interactions to remember:
  - PPIs inhibit the absorption of iron
  - Iron inhibits the absorption of Dolutegravir

**Formulations and doses**

<table>
<thead>
<tr>
<th>Iron preparation</th>
<th>Strength</th>
<th>Elemental iron</th>
<th>Who is it for?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ferrous gluconate</td>
<td>350mg/5ml</td>
<td>40mg/5ml (8mg/ml)</td>
<td>Infants - Adults</td>
</tr>
<tr>
<td>Ferrous lactate (Ferrodrops)</td>
<td>25mg/ml</td>
<td>25mg/ml</td>
<td>Preterm neonates from D21</td>
</tr>
<tr>
<td>Ferrous sulphate compound tablets</td>
<td>170mg</td>
<td>±65mg per tablet</td>
<td>Older children, adults</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group</th>
<th>Treatment dose</th>
<th>Prophylactic dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preterm neonate</td>
<td>Elemental iron: 2-4mg/kg/24hrs (Ferrodrops)</td>
<td>Elemental iron: 1mg/kg/day (Ferrous gluconate)</td>
</tr>
<tr>
<td>Children</td>
<td>Elemental iron: 1-2mg/kg/dose 8hrly (Ferrous gluconate)</td>
<td>Elemental iron: 1mg/kg/day (Ferrous gluconate)</td>
</tr>
<tr>
<td>Adults</td>
<td>Elemental iron: 100-200mg/day in divided doses (e.g. FeSO₄ 1 tab BD)</td>
<td>Elemental iron: 60mg/day (e.g. FeSO₄ 1 tab daily)</td>
</tr>
</tbody>
</table>
### Which Dressing When?

**FIRST, DECIDE WHICH DRESSING YOU NEED**
(REMEMBERING COST – DEC 2020 E Cape PRICES)

<table>
<thead>
<tr>
<th>INDICATION</th>
<th>WHEN TO USE:</th>
<th>DRESSING</th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prophylaxis</strong></td>
<td>Prophylactic dressing (to prevent pressure sores)</td>
<td>Granuflex Extra Thin</td>
<td>R92.00 per sheet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15x15cm (waterproof)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Protection for skin surrounding wounds. Prevention of secondary dermatitis caused by irritating discharges.</td>
<td>Paraffin Gauze (Jelonet) 10x10cm 10x40cm</td>
<td>R2.70 per sheet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OR Povodine Iodine 5% cream (Betadine)</td>
<td>R44.97 per 500g tub</td>
</tr>
<tr>
<td><strong>Burns</strong> (On admission)</td>
<td><strong>Acute</strong> superficial and partial thickness burns WHEN YOU PLAN WOUND REVIEW &lt;7d</td>
<td>Paraffin Gauze (Jelonet) 10x10cm 10x40cm OR Povodine Iodine 5% cream (Betadine)</td>
<td>R2.70 per sheet</td>
</tr>
<tr>
<td></td>
<td><strong>Acute</strong> superficial and partial thickness burns When there’s no need to review wound in the next 7d</td>
<td>Aquacel 15x15cm</td>
<td>R103.50 per sheet</td>
</tr>
<tr>
<td></td>
<td><strong>Infected</strong> wounds WHEN YOU PLAN WOUND REVIEW &lt;7d</td>
<td>Povodine Iodine 10% ointment (Betadine) OR Povodine Iodine 5% cream (Betadine)</td>
<td>R83.52 &amp; Or R44.97 per 500g tub</td>
</tr>
<tr>
<td><strong>Burns</strong> (Stable and healing – ward or home)</td>
<td><strong>Non-infected</strong> Partial skin thickness burns &lt;10% of TBSA <strong>DO NOT USE IF YOU PLAN WOUND REVIEW &lt;7D</strong></td>
<td>Aquacel 15x15cm</td>
<td>R103.50 per sheet</td>
</tr>
<tr>
<td></td>
<td><strong>Infected</strong> Partial skin thickness burn wounds <strong>DO NOT USE IF YOU PLAN WOUND REVIEW &lt;7D</strong></td>
<td>Aquacel Ag 15x15cm 20x30cm</td>
<td>R139.40 per sheet</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>R336.49 per sheet</td>
</tr>
<tr>
<td><strong>Burns</strong> (Out-pt)</td>
<td>Dressing clean, healing burns</td>
<td>Paraffin Gauze (Jelonet) 10x10cm 10x40cm</td>
<td>R2.70 per sheet</td>
</tr>
<tr>
<td></td>
<td>Minor burns and scalds (smaller than 10x10cm)</td>
<td>Granuflex E 10x10cm</td>
<td>R46.00 per sheet</td>
</tr>
<tr>
<td><strong>Circumcision wounds</strong> (infected) and Wounds in awkward areas e.g. fingers, toes</td>
<td>Consider Paraffin gauze if wound not infected</td>
<td>Aquacel Ag ribbon</td>
<td>R98.40 per ribbon</td>
</tr>
<tr>
<td>INDICATION</td>
<td>WHEN TO USE:</td>
<td>DRESSING</td>
<td>COST</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>---------------------------------------------------</td>
<td>--------------------------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td><strong>Leg / pressure / diabetic foot ulcers</strong></td>
<td><strong>Non-infected</strong> wounds</td>
<td>Aquacel 15x15cm</td>
<td>R103.50 per sheet</td>
</tr>
<tr>
<td>(in whom you expect healing)</td>
<td><strong>Clean, healing</strong> ulcers</td>
<td>Paraffin Gauze 10x10cm (Jelonet)</td>
<td>R2.70 per sheet</td>
</tr>
<tr>
<td></td>
<td><strong>Infected</strong> wounds – plan to leave dressing on 7d</td>
<td>Aquacel Ag 15x15cm</td>
<td>R139.40 per sheet</td>
</tr>
<tr>
<td></td>
<td><strong>Infected</strong> wounds, but frequent dressing changes</td>
<td>Povodine Iodine 10% ointment (Betadine) OR Povodine Iodine 5% cream (Betadine)</td>
<td>R83.52 &amp; R44.97 per 500g tub</td>
</tr>
<tr>
<td></td>
<td><strong>Moderate to heavily exuding</strong> wounds</td>
<td>Drawtex 10x10cm 20x20cm Kaltostat® sheets</td>
<td>R23.41 R90.78 R218.88 per sheet</td>
</tr>
<tr>
<td></td>
<td><strong>Lightly exuding</strong> wounds, especially if <strong>superficial</strong></td>
<td>Granuflex E 10x10cm OR Granuflex Extra Thin 15x15cm (waterproof)</td>
<td>R46.00 &amp; R92.00 per sheet</td>
</tr>
<tr>
<td></td>
<td><strong>Cavity</strong> wounds</td>
<td>Granugel OR Intrasite® Gel Kaltostat® Cavity</td>
<td>R36.48 R37.06 R63.84</td>
</tr>
<tr>
<td></td>
<td><strong>Deep</strong> pressure sores <strong>Venous</strong> ulcers</td>
<td>Intrasite® Gel Kaltostat® Cavity</td>
<td>R37.06 per tube R63.84</td>
</tr>
<tr>
<td></td>
<td><strong>Chronic</strong> wounds</td>
<td>Drawtex 10x10cm 20x20cm</td>
<td>R23.41 R90.78 per sheet</td>
</tr>
<tr>
<td><strong>Surgical wounds</strong></td>
<td><strong>Non-infected</strong> wounds</td>
<td>Granugel OR Aquacel 15x15cm</td>
<td>R36.48 per tube R103.50 per sheet</td>
</tr>
<tr>
<td></td>
<td><strong>Infected</strong> wounds</td>
<td>Aquacel Ag 15x15cm</td>
<td>R139.40 per sheet</td>
</tr>
<tr>
<td></td>
<td><strong>Post-operative suture wounds (POSW)</strong></td>
<td>Granuflex Extra Thin 15x15cm (waterproof)</td>
<td>R92.00 per sheet</td>
</tr>
<tr>
<td></td>
<td><strong>Complex surgical wounds</strong></td>
<td>Drawtex 10x10cm</td>
<td>R23.41 per sheet</td>
</tr>
<tr>
<td><strong>Skin grafts</strong></td>
<td></td>
<td>Paraffin Gauze 10x10cm (Jelonet)</td>
<td>R2.70 per sheet</td>
</tr>
<tr>
<td><strong>Compound fractures</strong></td>
<td></td>
<td>Paraffin Gauze 10x10cm (Jelonet)</td>
<td>R2.70 per sheet</td>
</tr>
<tr>
<td>INDICATION</td>
<td>WHEN TO USE:</td>
<td>DRESSING</td>
<td>COST</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-------------------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td><strong>Superficial skin infection</strong></td>
<td>Topical treatment of primary and secondary bacterial skin infections caused by <em>Staphylococcus aureus</em> and other susceptible organisms.</td>
<td>Povodine iodine (tube)</td>
<td>R6.78 per tube</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mupirocin (Bactroban®) ointment</td>
<td>Private sector</td>
</tr>
<tr>
<td><strong>Antiseptic use</strong></td>
<td>Used as an antiseptic in:</td>
<td>Povodine Iodine 10% ointment</td>
<td>R83.52 &amp; R44.97 per 500g tub</td>
</tr>
<tr>
<td></td>
<td>-Skin infections</td>
<td>OR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Wounds, cuts and abrasions</td>
<td>Povodine Iodine 5% cream</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Post-operative wounds</td>
<td>(Betadine)</td>
<td></td>
</tr>
</tbody>
</table>

SECOND, CONSULT THIS CHART TO ENSURE YOU PLAN TO USE THE DRESSING CORRECTLY

<table>
<thead>
<tr>
<th>DRESSING</th>
<th>FREQUENCY:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquacel 15x15cm</td>
<td>Remove after <strong>7 days</strong> unless early removal is clinically required.</td>
</tr>
<tr>
<td></td>
<td>Partial skin thickness burn wound (PSTBW) - Aquacel can be left in place for up to <strong>14 days</strong> provided the wound is not infected.</td>
</tr>
<tr>
<td>Aquacel Ag 15x15cm</td>
<td>Remove after <strong>7 days</strong> unless early removal is clinically required.</td>
</tr>
<tr>
<td></td>
<td>Partial skin thickness burn wound (PSTBW) - Aquacel Ag can be left in place for up to <strong>14 days</strong>.</td>
</tr>
<tr>
<td>Aquacel Ag ribbon</td>
<td>Remove after <strong>7 days</strong> unless early removal is clinically required.</td>
</tr>
<tr>
<td>Paraffin Gauze 10x10cm (Jelonet)</td>
<td>Depends on nature of wound.</td>
</tr>
<tr>
<td>Granuflex E 10x10cm</td>
<td>Dressings to be changed at intervals not exceeding <strong>7 days</strong>.</td>
</tr>
<tr>
<td>Granuflex Extra Thin 15x15cm (waterproof)</td>
<td>Leave on for <strong>7 days</strong></td>
</tr>
<tr>
<td></td>
<td>Post op surgical wound - remain until removal of sutures</td>
</tr>
<tr>
<td>Granugel</td>
<td>Every <strong>7 days</strong> for clean, granulating wounds.</td>
</tr>
<tr>
<td></td>
<td>Every <strong>3 days</strong> for sloughy, necrotic wounds.</td>
</tr>
<tr>
<td></td>
<td>Alternatively: when cover dressing leaks/changes.</td>
</tr>
<tr>
<td>Intrasite® Gel</td>
<td>Do not leave in wound for longer than <strong>3 days</strong>.</td>
</tr>
<tr>
<td>Drawtex 10x10cm</td>
<td>Change dressing every <strong>1-3 days</strong> as needed until exudate is under control. Thereafter, dressing can be changed after a maximum of <strong>7 days</strong>.</td>
</tr>
<tr>
<td>Kaltostat® Cavity</td>
<td>Apply dry into wound and secure with another dressing</td>
</tr>
<tr>
<td></td>
<td>Change daily if infected, else as needed (no max given)</td>
</tr>
<tr>
<td>Kaltostat® Sheet</td>
<td>Trim to correct size (no overlap onto skin). Apply dry onto</td>
</tr>
<tr>
<td></td>
<td>heavily exudative wounds, or moisten with saline. Secure with secondary dressing. Replace when comes through it (max 7d)</td>
</tr>
<tr>
<td>Povodine Iodine 10% ointment 500g (Betadine)</td>
<td>Used as many times a day as required, generally <strong>1-3 times daily</strong></td>
</tr>
<tr>
<td>Povodine Iodine 5% cream 500g (Betadine)</td>
<td></td>
</tr>
<tr>
<td>Mupirocin (Bactroban®) ointment</td>
<td>Apply to affected area 2-3 times daily for up to 10 days.</td>
</tr>
</tbody>
</table>

Pharmacy & Therapeutics – Dressings 236
“Needlestick” Protocol

To be followed after mucocutaneous exposure to potentially contaminated fluid or injury with a contaminated sharp object. For the full poster guideline, click here.

IMMEDIATE ACTION
1. For ocular (eye) exposure flush thoroughly with water for 15 minutes.
2. For injury with sharp object, milk the wound if possible (squeeze it to get blood out). Immediately wash the area with soap (preferably Hibitane) and water. Rinse well under water for 5 minutes.
3. For exposure in the mouth, spit out fluids and wash mouth repeatedly with large amounts of water.

IMPORTANT
1. Don’t panic! The vast majority of needlestick injuries end happily.
2. Remove yourself from the situation and seek help. Do not try and counsel the source patient or draw their blood yourself!
3. Get experienced advice. Not all exposures place you at high risk (see info sheet). Ask an experienced practitioner for advice and assistance once the steps below have been followed.

REPORT INCIDENT
1. Immediately report the accident to:
   a. Working hours: Health and Safety Officer
      OR Matron on duty
   b. After hours: Matron on duty
2. Complete an Accident Report Form including:
   a. Date, time & type of exposure (hollow needle, suture needle, lancet etc.)
   b. How incident occurred (state whether puncture wound and if bled or not)
   c. Name of source patient (a needle or sharp object of unknown origin should be kept for testing if required)

BLOOD TESTS FOR HIV AND HEPATITIS B
1. Employee should be given pre-test counselling and then tested for HIV antibodies (rapid test with confirmatory ELISA sent to lab) and HBSAb (Hepatitis B surface antibody) if HepB status unknown.
2. If the employee refuses HIV testing, they should sign the indemnity form provided.
3. Source patient should receive pre-test counselling and tested for HIV (rapid test with confirmatory ELISA sent to lab) and HBSAg (Hepatitis B surface antigen)
4. If the source patient refuses testing or is unable to give consent (e.g. is unconscious) either the matron on duty or doctor should be called. (A refusing patient may agree to have blood tested and not be told of the result.)

TAKE PROPHYLACTIC MEDICATION FOR HIV
If the employee tests POSITIVE for HIV no prophylactic antiretrovirals should be given. Follow up counselling and support should be offered. HAART is indicated.
If the employee tests NEGATIVE for HIV
a. And the source patient tests POSTIVE for HIV or their status is unknown, prophylactic anti-retroviral medication should be recommended and ideally be started within 1 hour. The sooner it is started the better. It must be started within 48 hours to be worthwhile. (Rarely up to 72 hrs or even longer.)
b. And the source patient tests NEGATIVE for HIV, the employee should be counselled about the window period and given the option whether to take prophylaxis or not.
c. The employee should be given the Staff information sheet “HIV exposure – your questions answered” before deciding whether to take prophylaxis. If the employee chooses not to take antiretrovirals they should sign the indemnity form provided.

The antiretrovirals are available from pharmacy. The recommended regime is:
- Tenofovir (TDF) 300mg plus Lamivudine (3TC) 300mg plus Dolutegravir (DTG) 50mg as the combination “TLD” one tab daily.
  - If GFR<50ml/min, TDF can be replaced with AZT 300mg BD. If AZT also contraindicated, discuss with expert. (d4T 30mg BD possible if available)
  - If DTG not tolerated or if <8wks pregnant, it can be replaced with Alluvia (200/50 2 tabs twice a day) or Atazanavir (300mg + 100mg Ritonavir, if >35kg) for 4wks
- If source patient has known resistance, discuss best regimen with expert
- EFV, NVP and ABC should not be used as prophylactic drugs.

Employees should be warned of the side-effects which include nausea, vomiting, fatigue, headache and insomnia. These side-effects may be debilitating while on the drugs. The benefits and risks of taking treatment, as well as drug-drug interactions should be discussed with all employees, especially those who are pregnant. Make plans for follow up adherence counselling.

FOLLOW UP AND MONITORING BLOOD TESTS
1. Employees who take anti-retroviral prophylaxis should have baseline blood tests for FBC, U&E and ALT taken on the day they start treatment.
2. These blood tests should be repeated after two weeks of treatment.
3. Employees who refuse to take antiretrovirals should be offered another HIV test after three months.
4. Employees who take anti-retroviral prophylaxis should have a repeat HIV test at three and six months.

PROPHYLAXIS AGAINST HEPATITIS B
1. Employees who have been immunised against Hepatitis B need no further prophylaxis to prevent infection.
2. Results of Hepatitis blood tests should be obtained as soon as possible. Intervention must occur within 72 hours of exposure to be effective.
3. If the source patient is HBSAg POSITIVE and the employee has a HBSAb level < 50iu/l then Hepatitis B Immunoglobulin should be administered. The employee should also be vaccinated against Hepatitis B.
4. It is noted that transport and other logistical restraints may make it impossible to reach this ideal in our current setting. Every effort should be made, however, to assist an exposed employee.
Other Useful Information

Laboratory Tests

A good relationship with the local laboratory is critical. Try to make friends with the lab techs, or at least get to know how their systems work!

This table provides a guide to which tube to use. You can indicate which tests are done on site, or referred, depending on your context.

### Chemistry

<table>
<thead>
<tr>
<th>Test</th>
<th>Container</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADA (CSF or pleural fluid)</td>
<td>Red top</td>
</tr>
<tr>
<td>Amylase</td>
<td>Red top</td>
</tr>
<tr>
<td>Ca, Mg, P</td>
<td>Red top</td>
</tr>
<tr>
<td>Carbamazepine/Phenytoin levels</td>
<td>Red top</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>Red top</td>
</tr>
<tr>
<td>CK</td>
<td>Red top</td>
</tr>
<tr>
<td>CSF – Protein</td>
<td>Red top</td>
</tr>
<tr>
<td>D-dimer</td>
<td>Green top (take after 16h00)</td>
</tr>
<tr>
<td>Folate</td>
<td>Purple top</td>
</tr>
<tr>
<td>Glucose</td>
<td>Grey top</td>
</tr>
<tr>
<td>HBA1C</td>
<td>Purple top</td>
</tr>
<tr>
<td>LDH</td>
<td>Red top</td>
</tr>
<tr>
<td>LFTs: (Protein, Albumin, T/bilirubin, D/bilirubin, ALP, GGT, ALT, AST)</td>
<td>Red top</td>
</tr>
<tr>
<td>PSA</td>
<td>Red top</td>
</tr>
<tr>
<td>Trop-T</td>
<td>Green top (take after 16h00)</td>
</tr>
<tr>
<td>TSH</td>
<td>Red top</td>
</tr>
<tr>
<td>U&amp;E (Urea, Creatinine, Na, K, Cl)</td>
<td>Red top</td>
</tr>
<tr>
<td>αFP</td>
<td>Red top</td>
</tr>
</tbody>
</table>

### Haematology

<table>
<thead>
<tr>
<th>Test</th>
<th>Container</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESR</td>
<td>Purple top (previously black)</td>
</tr>
<tr>
<td>FBC: (incl. Hb, MCV, WCC &amp; differential)</td>
<td>Purple top</td>
</tr>
<tr>
<td>INR</td>
<td>Blue top, full</td>
</tr>
</tbody>
</table>

### Serology

<table>
<thead>
<tr>
<th>Test</th>
<th>Container</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASOT (post-Strep diseases)</td>
<td>Red top</td>
</tr>
<tr>
<td>Bacterial antigen</td>
<td>Red top</td>
</tr>
<tr>
<td>CD4</td>
<td>Purple top</td>
</tr>
<tr>
<td>CRP</td>
<td>Red top</td>
</tr>
<tr>
<td>Cryptococcal antigen</td>
<td>Red top</td>
</tr>
<tr>
<td>HIV ELISA</td>
<td>Red top</td>
</tr>
<tr>
<td>NCC ELISA</td>
<td>Red top</td>
</tr>
<tr>
<td>RF</td>
<td>Red top</td>
</tr>
<tr>
<td>RPR (Syphilis)</td>
<td>Red top</td>
</tr>
</tbody>
</table>
Useful Information

Microbiology

<table>
<thead>
<tr>
<th>Test</th>
<th>Container</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood</td>
<td>Universal container</td>
</tr>
<tr>
<td>CSF</td>
<td>Universal container</td>
</tr>
<tr>
<td>CSF cell count &amp; microscopy</td>
<td>Red top</td>
</tr>
<tr>
<td>Fluid microscopy</td>
<td>Universal container</td>
</tr>
<tr>
<td>GeneXpert</td>
<td>Universal container</td>
</tr>
<tr>
<td>Pus swab microscopy</td>
<td>Pus swab</td>
</tr>
<tr>
<td>Sputum</td>
<td>Universal container</td>
</tr>
<tr>
<td>Stool microscopy</td>
<td>Universal container</td>
</tr>
<tr>
<td>TB (AFB) sputum/gastric washings/FNA</td>
<td>Universal container</td>
</tr>
<tr>
<td>TB Line Probe Assay</td>
<td>Universal container</td>
</tr>
<tr>
<td>TB sputum/gastric washing</td>
<td>Universal container</td>
</tr>
<tr>
<td>Urine</td>
<td>Universal container</td>
</tr>
<tr>
<td>Urine microscopy</td>
<td>Universal container</td>
</tr>
</tbody>
</table>

Virology

<table>
<thead>
<tr>
<th>Test</th>
<th>Container</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis Screen</td>
<td>Red top</td>
</tr>
<tr>
<td>HIV PCR</td>
<td>Blood spot paper</td>
</tr>
<tr>
<td>HIV PCR</td>
<td>Purple top</td>
</tr>
<tr>
<td>HIV viral load</td>
<td>Pearl top</td>
</tr>
</tbody>
</table>

Some important reminders

1. When doing an LP only put a very tiny amount in the grey top bottle as only glucose is tested from this sample. The two red (or clear, depending on our lab) bottles need much bigger samples as multiple tests are performed on these. Test requests should be for Chemistry, Microbiology, Cryptococcus (latex antigen test) and culture. There is no need for routine Cryptococcus testing in children under eight as this is rare. Do not request bacterial antigens unless polymorphs are seen.

2. Make sure you use the correct form. NHLS has separate forms for Cytology and Histology. Ensure a bar code sticker is stuck into the patients in- or out-patient notes when the specimen is drawn.

3. Put as much detail as possible on the form. The blocks shaded green are compulsory. You MUST complete patient name, your name and MP number, and the tests you want.

Tumour marker refresher

<table>
<thead>
<tr>
<th>Test</th>
<th>Tumour Type</th>
<th>Sensitivity/Specificity</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEA</td>
<td>Colorectal Cancer. (Also breast adeno, lung adeno)</td>
<td>B: 37%, C: 66%, D: 75%, Specificity 79%</td>
</tr>
<tr>
<td>CA 19-9</td>
<td>Pancreatic adeno  (also hepatobiliary &amp; gastric adeno)</td>
<td>Sensitivity 81%, Specificity 90%</td>
</tr>
<tr>
<td>βHCG</td>
<td>Testicular/Ovarian germ cell tumours</td>
<td></td>
</tr>
<tr>
<td>AFP</td>
<td>Hepatocellular carcinoma Non-seminomatous Germinal Testicular or Ovarian</td>
<td>Sensitivity 78%, Specificity 79%</td>
</tr>
<tr>
<td>CA 125</td>
<td>Ovarian carcinoma (Also endometrial adeno)</td>
<td>If &gt; reference range, do ultrasound</td>
</tr>
</tbody>
</table>
Disability Grants

People living in rural areas have higher levels of disability than their urban compatriots. They also have one of the highest rates of unemployment. This means that many families rely on a monthly disability grant (DG) as their sole source of income. Unfortunately, it also means that many people have come to see DGs as a form of income support grant.

Systems for accessing DGs will differ around the country. We are happy to share our system (contact us), but the following points of relevance and are worth being aware of.

1. There are many patients who legitimately qualify for DGs who are not getting them. Reasons for this include the fact that they do not have an Identity Document, that they do not know how to apply, or that the grant has recently been stopped (the reasons for which are often unclear).

2. Many patients with chronic illnesses, for example hypertension or diabetes, hope to get a grant despite the fact that their illnesses are well controlled on medication and therefore do not qualify as disabled according to criteria determined by the Department of Social Services. Many patients do not understand this.

3. In extreme cases some patients have actually refused treatment for their condition as they prefer to remain unwell and hopefully qualify for a grant, rather than “risk” getting better!

4. Patients with dire financial needs are often inappropriately referred to hospital for DGs by clinics and social workers who also mistake DGs for Income Support Grants.

5. Some patients qualify for Temporary DGs (for example, patients with tuberculosis). When they get better, however, the grant is stopped as they no longer qualify. Many do not understand this either.

6. Some patients have in the past been recommended for DGs by unscrupulous doctors. When these DGs are stopped, it is impossible to honestly recommend that they be recommenced.

We try to take the following into account as we play our part in helping people access this social service:

1. Patients who qualify for DGs are assisted in obtaining them as timeously as possible.

2. Patients who do not qualify are educated about the reasons they do not and encouraged to spare the expense of visits to Social Services and the hospital, while at the same time assisting them to access assistance from SASSA.

3. Acutely ill patients and their care should not be compromised by attending to DG applicants.

These objectives are difficult to balance and we recognise that given numbers of patients and doctors it will be difficult to keep everyone happy all of the time.
At Zithulele, we run an MDT DG Assessment clinic on a Friday in OPD. Only MDT team members can book patients for this clinic. We found previously that the vast majority of patients coming for assessment were patients with chronic illnesses, usually well controlled, who did NOT qualify for grants. As a result, we used to have a clinic booked up over four months in advance – making it difficult for people who genuinely qualify for grants to get seen and limiting the chance for people to get temporary grants. The waiting time is now 1-3 weeks.

Further points regarding patients with disabilities:
1. All patients who have disabilities are also offered the services of our Occupational Therapists, who specialise in assisting people with disabilities to be more functional in their everyday lives. They also assist with things like ordering wheelchairs for those who need them.
2. Patients with other social problems are referred to the hospital’s Social Worker.
3. Present staff and transport limitations dramatically reduce our ability to assist patients who are physically unable to get to hospital. When patients are completely unable to get to hospital, such cases should be brought to our attention and will be dealt with on an individual basis.

**Which Grant is Which?**

<table>
<thead>
<tr>
<th>Grant</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disability Grant</td>
<td>Grant paid to adults (&gt; 18yr) who are unable to seek work due to a medical condition or disability. May be temporary or permanent</td>
</tr>
<tr>
<td>Care Dependency Grant</td>
<td>Grant paid to adult carer of a child (&lt; 18yr) who require greater than normal amounts of care due to a medical condition or disability</td>
</tr>
<tr>
<td>Grant in Aid</td>
<td>Grant paid in addition to an adult who requires the full time help of another adult to care for themselves. Can be paid to recipients of DG or old age pension</td>
</tr>
<tr>
<td>Foster Grant</td>
<td>Grant paid to an adult who has become the legal foster parent of a child</td>
</tr>
<tr>
<td>Child Support Grant</td>
<td>Grant paid to the parent (usually mother) of a child &lt; 18yrs</td>
</tr>
</tbody>
</table>

Of course, hardest of all is trying to work out what combination of limitations actually crosses the threshold for a disability grant. Typically, you need to be “40% impaired” to qualify as disabled, though rural circumstances are considered. The best guide of which we are aware, is the Guidelines for the Medical Assessment of Disability for Social Assistance Purposes. We have put a copy on our website for easy access.
Referrals

Doctor’s Guide to Physio and Occupational Therapy

General Rules

- If in doubt, REFER
- Refer EARLY
- Don’t stress about whether OT / physio – they work closely together and will make sure the right person is seen

Physiotherapy
Any patient who would benefit from rehabilitation or who struggles with mobility or activities of daily living, including functioning in a home environment (think of us as body mechanics who make the body machine work better!)

Occupational Therapy
OT is all about enabling, regaining, maintaining of function and preventing the loss of function.

Is the patient…
- No longer able to do what he did before?
- At risk of losing function?
- Needing help looking after himself?
- Not doing what is expected for age group?

Paediatrics

Occupational Therapy and Physiotherapy

High risk infants:
- Neonatal encephalopathy, Low apgars, premature, low birth weight
- Developmental delay, Cerebral palsy, Muscular dystrophy, Downs Syndrome, Club foot
- Burns – especially crossing the joints or involving the hands, face or limbs
  - Ward management: early mobility, splinting and maintaining function
  - Medium term follow up : scar management

Occupational Therapy
Intellectual impairment, Schooling problems, Behavioural problems
If you think the child doesn’t look right or isn’t on par with their peers

Physiotherapy
Fractures, Arthritis
Cardiorespiratory conditions: cystic fibrosis, bronchiectasis, pneumonia
**Adults**  
*Occupational Therapy and Physiotherapy*

**Neurology**  
- CVA, head injury, spinal injury  
- Polyneuropathies, peripheral nerve injury and neuropathy (UL: OT, LL: physio)

**Burns** (as per paed), Amputees, Wheelchair/special seating

**Physiotherapy**  
Cardiorespiratory problems  
- Acute and chronic lung conditions with problems such as: clearing secretions, decreased air entry, decreased exercise tolerance, asthma, ICDs,

**Orthopaedic/Musculoskeletal**  
- Sports injuries, acute soft tissue or ligament injuries  
- Pathological back pain  
- All post POP’s  
- Mobility problems, posture, leg length discrepancy, scoliosis  
- Joint problems  
- People who need contact with the Orthotics and Prosthetics department from BOH  
- Walking aids  
- TB spine

**Women’s Health**  
- Incontinence (stress or other)  
- Post-partum or antenatal advice on pelvic floor health

**Occupational Therapy**  
**Hand and Upper Limb**  
- Stabbings, lacerations and GSW  
- Nerve injuries  
- Post hand surgery (NB: When referring to Mthatha for this, request return to ZLE for rehab!)  
- Infections and post I & D  
- Amputations  
- Post POP, post ORIF, other orthopaedic  
- Rheumatoid arthritis

**Mental Health**  
- Hope therapy  
- Stress  
- Grief  
- Trauma counselling, incl rape or abuse  
- Schizophrenia  
- Depression  
- Anxiety Disorder
Referrals to Audiology and Speech Therapy

SPEECH THERAPY:
- Communication disorders
- Feeding and swallowing disorders

Communication:
- Voice: Unable to voice, or voice is hoarse, breathy or strained.
- Speech: Unable to speak, unclear or slurred speech, or speech sounds produced incorrectly or omitted.
- Stuttering
- Language:
  - Adults: Difficulty understanding or producing appropriate language
  - Paeds: Age-inappropriate comprehension or production of language
- Oral Motor: Inco-ordination, weakness or paralysis of any part of the oral mechanism.

Feeding and Swallowing:
- Signs of aspiration
- Malnutrition
- Odynophagia
- Globus
- Gastro-Oesophageal Reflux
- Poor weight gain, or Failure to Thrive

Other Special Interest Groups
- Cleft lip and/or palate
- Facial burns (prevention of keloid scars)
- High Risk Neonates: HIE, LBW, premature, sensory impairments

Common speech and language conditions in adults – getting the terms right

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dysfluency</td>
<td>Inability to produce smooth, fluent speech</td>
</tr>
<tr>
<td>Aphasia</td>
<td>Inability to produce or understand speech as a result of brain damage</td>
</tr>
<tr>
<td>Dysarthria</td>
<td>Weakness or paralysis of the muscles used to produce speech, e.g. muscles in our face, lips, tongue and throat, as well as muscles for breathing. Affects articulation, resonance, phonation, respiration. Usually no language difficulties</td>
</tr>
<tr>
<td>Apraxia</td>
<td>Damage to the brain pathways involved in planning the sequence of movements involved in producing speech, someone with AOS has trouble saying what s/he wants to say correctly and consistently</td>
</tr>
<tr>
<td>Dysphagia</td>
<td>Difficulty swallowing</td>
</tr>
</tbody>
</table>

Clinic screening
Speech Therapy continues to visit certain clinics to enable people living far from the hospital to access our services, but this service is under-utilised. If you feel that a patient would benefit from STA, check for available dates at their clinic and bring the patient back accordingly.
AUDIOLOGY:
- Hearing impairment
- Balance difficulties or vestibular pathology

Hearing Difficulty

<table>
<thead>
<tr>
<th>All Patients</th>
<th>More Common in Paediatrics</th>
<th>More Common in Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Frequent misunderstanding, or requests for repetition of, spoken language.</td>
<td>- Speech spoken at inappropriate intensity</td>
<td>- Difficulty following conversation in group settings</td>
</tr>
<tr>
<td>- Tilting head when trying to listen</td>
<td>- Auditory hypersensitivity</td>
<td>- Difficulty hearing in noisy environments</td>
</tr>
<tr>
<td>- Cul-de-sac resonance</td>
<td>- Delayed response to auditory stimuli</td>
<td>- Trouble hearing women and children</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>More Common in Paediatrics</th>
<th>More Common in Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Failure to startle to sudden loud sounds</td>
<td>- Inappropriately loud volume of television / radio</td>
</tr>
<tr>
<td>- Failure to respond when called</td>
<td>- Relies on speech-reading more than audition</td>
</tr>
<tr>
<td>- Difficulty localising to sound (turning head to look for sound source)</td>
<td>- Deterioration in speech production</td>
</tr>
<tr>
<td>- Inconsistent response to auditory stimuli</td>
<td></td>
</tr>
<tr>
<td>- Delayed / deviant speech development</td>
<td></td>
</tr>
<tr>
<td>- Prefers to work alone, withdrawn</td>
<td></td>
</tr>
<tr>
<td>- Otalgia</td>
<td></td>
</tr>
</tbody>
</table>

Vestibular Disorders

**Signs of Vestibular Disorders:**

<table>
<thead>
<tr>
<th></th>
<th>Disequilibrium / poor balance / falls</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Persistent position / movement-induced vertigo</td>
<td>Visual motion sensitivity (visual vertigo)</td>
</tr>
<tr>
<td>- Motion sensitivity</td>
<td>Mal de Débarquement</td>
</tr>
<tr>
<td>- Blurred vision with head movements</td>
<td>Migraine associated dizziness</td>
</tr>
</tbody>
</table>

Other Special Interest Groups

- Craniofacial anomalies
- Ear canal management (as required, for difficult cases)
- Patients requiring ENT referral (patient should go with a recent audiogram)
- High-Risk Neonates and Infants

DG assessments:
Patients who need audiology assessment for a DG application must have their hearing assessed **twice** before the DG can be booked. Please refer these patients directly to audiology, and we will book these patients as appropriate.

Otitis media
Cases of otitis media should only be referred for audiology if:
- All treatment options have been exhausted, and an ENT referral is warranted.
- Hearing loss persists after the infection has been resolved.
**Referrals to Dieticians**

The following IN-PATIENTS should be referred

<table>
<thead>
<tr>
<th>Paeds</th>
<th>Maternity</th>
<th>General</th>
<th>MDR - TB</th>
</tr>
</thead>
<tbody>
<tr>
<td>- SAM</td>
<td>- Breastfeeding</td>
<td>- NGT</td>
<td>- Underweight</td>
</tr>
<tr>
<td>- MAM</td>
<td>- Poor feeding</td>
<td>- Poor oral intake</td>
<td>- Poor oral intake</td>
</tr>
<tr>
<td>- Failure to thrive</td>
<td>- LBW/ VLBW</td>
<td>- TB and/ or HIV</td>
<td>- Vomiting</td>
</tr>
<tr>
<td>- Breastfeeding</td>
<td>- Premature infants</td>
<td>- Diabetes</td>
<td>- Diarrhoea</td>
</tr>
<tr>
<td>- Re-lactating</td>
<td>- NGT</td>
<td>- Hypertension</td>
<td></td>
</tr>
<tr>
<td>- Introducing solids</td>
<td>- Milk bank</td>
<td>- Renal impairment</td>
<td></td>
</tr>
<tr>
<td>- Constipation</td>
<td>- Breastmilk pasteurizing</td>
<td>- Heart disease</td>
<td></td>
</tr>
<tr>
<td>- Obesity</td>
<td></td>
<td>- Burns</td>
<td></td>
</tr>
<tr>
<td>- Poor feeding</td>
<td></td>
<td>- Obesity</td>
<td></td>
</tr>
<tr>
<td>- NGT</td>
<td></td>
<td>- Liver disease</td>
<td></td>
</tr>
<tr>
<td>- Burns</td>
<td></td>
<td>- Cancer (esp. oesophageal)</td>
<td></td>
</tr>
<tr>
<td>- Congenital heart defects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Cerebral palsy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- HIV and/ or TB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Renal disease</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Liver disease</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The following OUT-PATIENTS should be referred

<table>
<thead>
<tr>
<th>Lifestyle &amp; GIT</th>
<th>Paeds</th>
<th>Other</th>
<th>PHC clinics</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Weight management</td>
<td>- FTT</td>
<td>- HIV/AIDS</td>
<td>- DIABETES</td>
</tr>
<tr>
<td>- Metabolic syndrome</td>
<td>- MAM</td>
<td>- Cancer</td>
<td>- Hypertension</td>
</tr>
<tr>
<td>- DM</td>
<td>- SAM</td>
<td>- Anaemia</td>
<td></td>
</tr>
<tr>
<td>- HPT</td>
<td>- Poor feeding</td>
<td>- Bone disease</td>
<td></td>
</tr>
<tr>
<td>- Cardiovascular</td>
<td>- Weight checks</td>
<td>- Renal disease</td>
<td></td>
</tr>
<tr>
<td>- Liver</td>
<td>- Obesity/ overweight</td>
<td>- Food allergy</td>
<td></td>
</tr>
<tr>
<td>- Pancreas</td>
<td></td>
<td>- Neurological incl: swallowing difficulty, eating disorders</td>
<td></td>
</tr>
<tr>
<td>- Upper GI incl: GERD, gastritis, ulcer</td>
<td></td>
<td>- Poor weight gain in pregnancy</td>
<td></td>
</tr>
<tr>
<td>- Lower GI incl: gas, diarrhoea, gluten/lactose intolerance, constipation</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Paediatrics:**

- Malnutrition (stunted, wasted)
- Weight checks
- Breastfeeding education
- Introduction of solids

**Adults**

- Malnutrition
- Weight checks
- Obesity

Do not promise a patient supplements! Allow the dietician to assess them first 😊
Arranging an Emergency Ambulance

- Emergencies referrals obviously need to go by ambulance. To arrange transfer you will need to contact Metro. The speed dial is (558)401. You will need to give them the name of an accepting doctor. This may not be as simple as it seems!
- Ask to speak to the shift supervisor if you have any “special requests” – even oxygen – or experience any delays.

Arranging “The Balloon” (The Helicopter)

The helicopter is available for critically ill patients when the weather is good. Phone the Mthatha flight desk on 047-5312641 to request it (once you have spoken to the receiving doctor). The helicopter will not take patients with active TB, Covid, nor (usually) pregnant women.

EMS Escalation plan

EMS are committed to working together with us to ensure that our patient get access to Emergency Transport as quickly as possible, within the resource constraints we all know exist.

If you have problems with:
1. Unable to get hold of Control Room (phone rings unanswered, repeatedly)
2. Ambulance taking longer than expected
3. EMS staff refuse to take the patient (EMS or ambulance)

Please escalate as follows:
1. Phone a Control Room Supervisor
   a. Calaza 072-1224181
   b. Msengana 081-5003179
   c. Ngidi 083-4798366
   d. Nkohla 082-6944885
2. Phone the Ngcwanguba Manager
   a. Mr Ndlwana 081-2142382 or 073-5503017
3. Phone the Mthatha Manager
   a. Mr Madikizela 0632531026
4. Phone Clinical Manager to post on the EMS group or escalate further

Please note these possibilities for contacting EMS Control room
047-5315240
047-5315241
047-5315242
047-5324174
047-5323368
047-5323384
047-5323386
047-5312641
• If you really get stuck, you can phone the ECDOH Help-line 0800-032364 and ask them to help arrange the ambulance.
• If the phones are down, you can use the cell phone emergency service (112).
• Please report any significant deviations from what is acceptable to Mr Madikizela, and copy Clinical Manager.

**Booking the Patient Transport Vehicle**

For patients going to OPD dates, there is a PTV (Patient Transport Vehicle) service that operates every morning, Monday to Friday. It is administered by Metro and stationed in Mthatha. These patients need to be booked in the book. If the PTV doesn't appear to have arrived, you can phone and ask to speak to a supervisor.

1. **Encourage all patients to find their own transport** to appointments at NMAH if they can afford it.
2. **Try to discourage the automatic booking of patients given review dates** at NMAH. If you can, check if a patient genuinely needs to return. (Often this happens without us knowing.)
3. A maximum of 22 patients may be booked for any day, leaving space for escorting nurses.
4. **When a patient requires a relative escort**, this escort needs to be booked in their own capacity!
5. **When patients get next-day bookings for acute conditions** and the transport is full, they may be booked as a *Reserve* patient. This is in case not all booked patients arrive. If all booked patients arrive then the doctor will need to arrange an ambulance to transfer the patient.
6. **Patients should be allowed onto the transport** on a **FIRST BOOKED, FIRST ON** basis.
7. **Patients going to EAST LONDON**, need an ambulance booked the night before (phone after 7pm) to take them to Mthatha where they will catch the PTV to East London. You don't need to book that PTV.
Referring Children

- Patients who need care at secondary or tertiary level are referred to Nelson Mandela Academic Hospital or Bedford Orthopaedic Hospital in Mthatha.
- Emergency referrals need to be discussed with the doctor on call or the consultant in charge of the relevant clinic, prior to sending.
- Referrals to OPD clinics vary depending on the clinic. See table below for clinic days and doctors in charge. All children’s OPD clinics are held in Paediatric OPD, Level 3, NMAH. Appointments do not need to be booked, just make sure they are going on the relevant day, with proper workup.

**POPDA 047-5024775**

<table>
<thead>
<tr>
<th>Day</th>
<th>Clinic</th>
<th>Consultant</th>
<th>Contact No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mon</td>
<td>Respiratory &amp; Allergy</td>
<td>Prof. D. Perez</td>
<td>082-2020984</td>
</tr>
<tr>
<td></td>
<td>Infectious disease</td>
<td>Dr Makhongwana</td>
<td>083-4164113</td>
</tr>
<tr>
<td>Tues</td>
<td>Cardiac</td>
<td>Dr Tshabalala</td>
<td>083-4755653</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>060-5579696</td>
</tr>
<tr>
<td></td>
<td>Rheumatology &amp; Endocrine</td>
<td>Dr Sotobe</td>
<td>082-5980848</td>
</tr>
<tr>
<td>Wed</td>
<td>Haematology</td>
<td>Prof. B.A. Ogunsanwo</td>
<td>084-3212482</td>
</tr>
<tr>
<td></td>
<td>Neurology</td>
<td>Dr Quvile</td>
<td>076-1522007</td>
</tr>
<tr>
<td>Thurs</td>
<td>Nephrology</td>
<td>Dr. K.S. Gaire</td>
<td>083-3780798</td>
</tr>
<tr>
<td></td>
<td>Neonatology</td>
<td>Dr Meyer</td>
<td>072-2253273</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dr Mafongose</td>
<td>073-5379835</td>
</tr>
<tr>
<td>Fri</td>
<td>Epilepsy</td>
<td>Dr Quvile</td>
<td>076-1522007</td>
</tr>
</tbody>
</table>

- All referrals should be accompanied with the results of basic investigations, i.e. FBC, U&E, Urine, CXR etc.
- Children should be accompanied by the primary care giver and relevant consent forms should be signed.
- Please do the following investigations for all renal patients:
  - Urine protein/creatinine ratio
  - FBC, E&E, ASOT
  - BP on all limbs
  - Input/out put record
  - Other relevant history: e.g. TB, medications etc.

**Paediatric surgery:**
Paeds surgery clinic (open referrals, no booking required) at NMAH on Thursdays. Discuss with Dr Kopolo (083-4559773). If Dr Kopolo not available, particularly complicated cases or neonates can also be discussed with Paeds surgery in East London. Their on-call cell phone is 083-3781061.

**Neonatal emergencies:** Most patients need referral to Mthatha General (Regional) Hospital. Discuss with on call via 047-5024407.

**Orthopaedics** in children: Please see the detailed information re referring to Bedford in separate section. Getting beds for children is usually possible.
Adult Referrals to NMAH

Medical MOPD 047-5024612

<table>
<thead>
<tr>
<th>Day</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>Hypertension Renal</td>
</tr>
<tr>
<td>Tuesday</td>
<td>Diabetes Epilepsy</td>
</tr>
<tr>
<td>Wednesday</td>
<td>Haematology (incl INR) Pericarditis Endocrine</td>
</tr>
<tr>
<td>Thursday</td>
<td>Cardiac Neurology Rheumatoid Arthritis New referrals (general)</td>
</tr>
<tr>
<td>Friday</td>
<td>Pulmonology Gastroenterology</td>
</tr>
</tbody>
</table>

Doctors with special interests:
Cardiology Dr Moeketsi* 071-9234127
Dr K Thomas* 083-3781264
Dermatology Dr Mankahla* 083-6547566 (see comment below)
Endocrinology Prof Chooks 071-4516355
Epilepsy Dr Ibanez 082-2007770
Haematology Prof Ogunsanwo 084-3212482
Neurology Prof Foyaca 082-2020980
Pulmonology Dr Tau* 083-9570115
Renal Prof Mashiyi 083-7031715
Rheumatology Dr Dubula 084-5570657

Dermatology 082-9358378
The dermatology clinic at NMAH runs a great service. Contact the Reg on call via the cell phone that is kept in the nurses’ station (082-9358378). Dr Mankahla offers excellent advice and appreciates pics with well-presented cases, but is HOD, so use registrar first – send pictures by Whatsapp.

Radiology 047-5024440
It is very difficult to access a radiologist from outside of NMAH. Arrange acute CT scans with medic on call. (Do a Creatinine first.) If appropriate ask for a scan without admission. Inform EMS of this when booking transport. More scans come with reports these days, but if you need a report, find a friendly medic and ask them to facilitate getting it. They can also now email the report to Ben’s email.

Spirometry
If you can’t manage to do using our machine at Zithulele, there is an open clinic run by Occupational Health (on grounds of NMAH but not actually part of the hospital). Send Monday to Thursday. Make sure they are GeneXpert and CRP negative.
Oncology
NMAH has an oncologist! Dr Jafta (082-7733173) is supported by excellent professional nurses. Dr Ngcuka (083-2778273) is also very helpful. Contact oncology department via switchboard. For chemo, pts need WCC>3, Hb>8, Plt>100. They must go with printed out tissue diagnosis, as well as LFT, U&E, FBC, CXR + abdo ultrasound. Patients still go to EL for radiotherapy. EMS take them via NMAH. Frere oncology is at 043-7092230/2403/2225 and the Head is Dr Pokharel 083-3781078.

Microbiology
If you want to discuss a culture result or antibiotic choice, speak to Prof Vasaikar (082-2021057) or Dr Apalata (082-5009728). There is also a NMAH AMS Whatsapp group if you’re interested. To follow up an unreported culture result, speak to the head tech Patricia on 073-7429694.

General Surgery  SOPD 047-5024700

<table>
<thead>
<tr>
<th>Monday</th>
<th>Urology, general surgery, vascular</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuesday</td>
<td>General surgery, vascular</td>
</tr>
<tr>
<td>Wednesday</td>
<td>Cardiotoracics</td>
</tr>
<tr>
<td>Thursday</td>
<td>Paediatrics</td>
</tr>
<tr>
<td>Friday</td>
<td>Plastic surgery</td>
</tr>
</tbody>
</table>

Helpful contacts:
HOD: Dr Maloa* 083-3781410
Urology: Dr Petse 082-4127983
Plastics (esp burns): Dr Sidondi 072-6776889

- All clinics except cardiothoracics (& paeds) need you to speak to a doctor before making an out-patient appointment.
- For emergencies it is usually better to speak to the second on call (MO/Reg). The first on call is the comm serv.
- Oesophageal cancer patients should go to cardiothoracics with a recent U&E.
- See paediatric referral section for advice on children who need surgery.

Endoscopy  047-5024707
You can often book endoscopy by speaking to the on call doctor, but if you have trouble contact Dr Malongwe (073-1561715), Dr Mpikashe (073-3981060) or Dr Mzayiya (071-4631541) and then phone NMAH ext 4707 or 4713 to make appointment. The accepting doctor will indicate what work up is required for each patient.

Eye Clinic  047-5024670 or 047-5024703
Monday and Wednesday.
No need to discuss with a doctor if routine referral. Must make an appointment. Phone doctor to discuss more urgent cases to get earlier appointment (wait is 3 months or more). Discuss emergencies with doctor on call.
All cataracts, refractory errors and glaucoma patients should be referred to the Grace Vision Zithulele team – see details in separate Optometry section.
**ENT Clinic** 047-5024809

Every day
No need to discuss with a doctor if routine referral. Must make an appointment. Easiest to send via our audiologists! Phone doctor to discuss more urgent cases to get earlier appointment and discuss emergencies with doctor on call.

**Maxillofacial**
First port of call for all maxillofacial patients is our dentist. Phone and discuss with Dr Opio 071-8543716 if the dentist is not available.

**Gynae Clinic** 047-5024771/2
Open clinic for referrals. Helpful consultants are Dr Giyose (073-6466152) and Dr Qhuta (076-6469150).

**Forensics**
If a patient has an unnatural death, they need an autopsy. The police need to be informed and an inquest opened to determine what happened. They will usually arrange with forensics for the required autopsy. To discuss a case or request advice on a non-police case, phone Prof Mirta 047-5024883 (office in university). If you need help with logistics, Mr Nkohla from the Forensic mortuary can help: 047-5024461.

**Optometry – Grace Vision Zithulele**

Since 2012 our patients have been able to access optometry services through Grace Vision Zithulele, previously known as Mercy Vision. The service comprises correction of refractory errors (premade “reading glasses” or custom-made spectacles as required, currently at a nominal cost of R50), cataract screening and surgery (done at Zithulele!) Glaucoma follow up as well as care for primary eye care problems are also part of their service.

Grace Vision now also has a school program and screen all children age 7,9 and 11 in local primary schools.

The team visits 12 clinics around Zithulele and has regular days at the hospital. Please consult the latest schedule to find the best place to send your patient to.

Direct referrals requiring more urgent attention (emergencies) should be discussed with optometrist Don Thorrold (082-7884007), or contact Asanda Jonga (0817172327)

We have also expanded: there is a second base at Canzibe Hospital now too, though the surgery all happens at Zithulele. Speak to Asanda about referring a patient who lives closer to Canzibe.

The closest private optometrists are Vision Care in Mthatha, opposite the Supreme Court in Craister Street. Ph 047 5313358. They offer free sight tests on a Monday, Wednesday and Friday.
Psychiatry & Psychology Referrals

Contact details: Mental Health Unit: 047-5024140
Prof Zingela 083-3780917

All referrals should be discussed with the doctor on call or in the clinic. Dr Suresh-Nair is particularly helpful (073-5253470). Out-patients requiring psychiatry assessment can be sent any day Tuesday to Thursday.

Patients with psychiatric emergencies are meant to be admitted to a Listed Hospital (Zithulele is a Listed Hospital) for a period of 72 hours before being transferred to a Psychiatric Hospital (Mthatha Mental Health Unit at NMAH). This is to rule out any organic disease. When the patient is aggressive or violent you may request but not compel a family member to help supervise them, but this may be problematic if violence is directed to the family and it is against rights to compel it.

Most of our admissions fall into one of two scenarios:

Scenario 1:
After an application has been made through MHCA 04, two mental health care practitioners recommend assisted/involuntary care. After the 72-hour assessment the user is discharged home.

*** Forms required: MHCA 04; MHCA 05 x2; MHCA 07; MHCA 06 x2; MHCA 03

Scenario 2:
After an application has been made through MHCA 04, two mental health care practitioners recommend assisted/involuntary care. After the 72-hour assessment the Head of Health Establishment (HHE) requests approval for further involuntary care on an inpatient basis.

*** Forms required: MHCA 04; MHCA 05 x2; MHCA 07; MHCA 06 x2; MHCA 08; MHCA 11 (transfer)

Please note the following important things about the MHCA forms:

- **MHCA Form 4**: Must be completed by the applicants (family) or health care provider at Zithulele for the 72 hour assessment. All three pages must be completed. A commissioner of oaths (clinical managers, NSMs and CEOs are ex-officio commissioners) must stamp the form with the correct stamp.
- **MHCA Form 5**: Two form 5s, completed by TWO health care providers, one of whom can be a nurse. Must sign one form each. Complete only Section 8 (for assisted care) OR Section 9 (involuntary care), not both.
- **MHCA Form 6**: On completion of the 72 hour assessment period, two form 6s must be completed by TWO health care providers, one of whom can be a nurse. The date must be 72 hours after the dates on Form 5s.
- **MHCA Form 7, Form 8 and Form 11**: To be signed by CEO (HHE). If not available, this function must be delegated in writing to another senior clinician (e.g. clinical manager or Family Physician, or senior MO), but not to the same person acting as the Commissioner of Oaths. On Form 8 the reason for the current admission must be given.

Upon referral, TWO copies must be made of all the forms. Send the originals to the MHC Review Board (at 11th Floor, Room 42, Botha Sigcau Building, Mthatha), one copy with patient, one copy in Hospital file.
When patients are referred to MMHU they must also go with:

1. A referral letter including their examination findings, investigation results and medication history.
2. A relative, if at all possible.

Final MHCA notes
If it is not possible to safely or effectively manage the patient at Zithulele for the required 72 hour assessment period, the doctor must discuss it with the psychiatrist on call at MMHU to decide about further management.

If you are confused, or need help with legalities, the head of the Review Board is very approachable. Contact Ms Siphokazi Njezula on 083-3370792.

Referring to psychology
The Mthatha Mental Health Unit has psychologists in addition to psychiatrists. There are only four for the whole district, but they are happy to give advice on the phone and for patients most in need of their services, provide an excellent option. Book an appointment by phoning the Mental Health Unit and asking to be put through to a psychologist.
Alternatively, if you can’t find one through switchboard, try:
- Chantel Goliath 084-3257572
- Mhlali Faxi 061-5285655
- Nonjabulo Shange 072-3947489
- Lynette Mgobozi 076-1641361
- Madikizela 079-4994700
Orthopaedic Referrals

Contact details:  
Bedford Orthopaedic Hospital: 047-5310155 or 047-5324489  
OPD / on call cell: 071-0329758  
Dr Nxiweni 063-4037094 (in charge)

Bedford is, in general, overwhelmed by their case load and frequently has to opt for conservative management of fractures. **Please only send patients for whom conservative management is substantially below par** (e.g. femur fractures, forearms needing ORIF). Discuss with a senior re any X-ray for which you are unsure about the interpretation or management.

If you need to get hold of Bedford, find a comfy chair and settle in. Cell phone reception is extremely poor in their area. Try the landlines or the OPD / on call cell number (above). You can find out who is on call and get their personal cell number by phoning switchboard at NMAH. Note, the on call only starts at 16h00.

For emergencies, please note the important points below.

**Cold cases** go to OPD, after discussion. Try ask switchboard for who is currently in charge of upper or lower limb or spinal firms as appropriate. They are then followed up strictly according to the firm they are managed by and will be sent away if they go on another day.

A patient who requires orthotics or prosthetics should be discussed with our therapy department, but can also be discussed with Mr Pretorius 079-4776401. They need to go with a request form (kept by our physios) and can go any day of the week, though Fridays are better due to transport bookings. Corsets are reasonably readily available, but other items can take months or even years. They should go directly to O&P which is just outside the hospital.

Children with club foot must be discussed immediately with our therapists. Most of them are managed here. Dr Nico van der Byl at Frere is happy to give advice for these cases. Preferably contact him by Whatsapp on 082-2025211

**Cases needing admission** must not be sent to BOH if you have not called ahead to the consultant or medical officer on call. Bed space at BOH is at a premium so they can only accept patients when they have the beds for them. Unfortunately, patients closer to Mthatha effectively get preference due to transport so getting your patient “in” may take persistence. We find it works best to try and “swap” a patient. Offer to take a patient with bed sores or needing long term rehab. EMS must start here and then collect one of their patients when they drop off. That way the bed doesn’t get given away in the interim.

It is usually much easier to get children accepted than adults and acute cases are accepted any day of the week.
Other points to note are:

- All polytrauma patients (injuries to the musculoskeletal system plus other systems e.g. head injury, abdominal injury, chest injury) must first be referred to Nelson Mandela Academic Hospital Accident and Emergency, where they will be assessed and co-managed with other specialities. *Chest, abdominal & head injuries kill quickly, fractures do not.*
- Suspected vascular injury and compartment syndrome should be referred to NMAH A&E department with instructions to call the orthopaedic surgeon on call.
- Peripheral vascular disease patients are first seen at NMAH for vascular assessment.
- All minors (less than 18 years) must be accompanied by a parent or a responsible guardian. Where this is logistically impossible the referring doctor must call BOH, and help to get informed consent signed before the patient is referred i.e. get an idea of what procedure the consent is needed for.
- Do not send cold cases. (deformities, chronic infections, TB spine, arthritis, back pain, etc.) as emergencies, send them to the relevant outpatient clinics.
- All open fractures must have a copious wound washout with 2 to 4 litres of normal saline, I.V. Broad spectrum antibiotics (see antibiotic guide), anti-tetanus prophylaxis and splinting before being transferred to BOH. Do not transfer a fracture without some form of temporary stabilization.
- All hand injuries with open fractures or tendon injuries should have a wound washout and skin only apposed loosely before referral. All other open fractures should have their wounds left open & dressed with sterile gauze.
- Splinting for transport; Upper limbs & tibia: Plaster slabs. Femur: Skin traction with a Thomas splint, if there is one.
- All emergency referrals should (if possible) go with Hb and x-rays at least & with a letter detailing the history, examination and any interventions already carried out. This includes a good description of the wound in case of open fractures.
- All cold (non-emergency) referrals must go with FBC, U&E, ESR (especially TB spine), x-rays and any other relevant investigations plus a letter summarising the history, physical examination and any interventions.
- There is a clinic for Clubfoot deformities which runs with the Paediatric clinic on Tuesdays. Please send in babies with clubfoot as soon as possible after birth, but first discuss with therapy.
Jabulani Patient Assistance Fund

The socio-economic reality in our area means that, for many patients, getting to hospital is a significant, potentially financially crippling, expense. A lack of finance is a major reason for delayed presentations and missed appointments. As a result, various staff have over the years felt they wanted to contribute to assisting patients to come to return appointments.

As you can imagine, this can lead to tricky situations if it is done from individual pockets. Staff get seen as “soft” or “preferred” and there is potential for misunderstanding and abuse. As a result, we formalised the assistance by asking the Jabulani Rural Health Foundation to become involved. They regulate and monitor the use of the fund – for example by making sure that various criteria are met, by keeping abreast of current taxi fares to the different parts of our catchment area and by looking after the money.

If you have a patient who expresses that they might not be able to make the appointment you want them to get to because of their finances, please consider referring them, using the form, available from Nonceba.

You are also encouraged to contribute to the fund if you wish 😊 All donations to Jabulani are tax deductible. For more information speak to Ben Gaunt or John Young.
Mentor Mothers Zithulele (MMZ)

Mentor Mothers is a community-based maternal, child health and nutrition program, based on a model developed by Philani Nutrition Centres Trust (Cape Town). Over sixty “Mentor Mothers” (MM’s) from the community have been trained to identify malnourished children under 6 years and provide home based growth monitoring and rehabilitation of malnourished children. They also provide home based support of pregnant women and new moms as well as assistance for accessing social grants and other important social documents. They cover a large area surrounding the hospital, and are expanding all the time. There are two programs – one based at Zithulele and another based in Coffee Bay.

THINGS YOU NEED TO KNOW:

- **MM’s are trained to REFER at-risk moms and children, and are allowed to refer directly to the hospital when needed.** You will see a referral slip filled in by the MM in the patient’s book. They work hard to make sure referrals are appropriate and do not waste doctor time – please discuss dubious (or excellent!) referrals with the MMs’ manager, noting the MM’s name.

- **MM’s also work in the HOSPITAL.** 3 MMs take turns providing support and counselling & BF support in Maternity and Paeds wards daily.

- **MATERNITY & PAEDS in-patients who return home to a MM’s area are automatically referred for a follow-up visit at home on discharge.** If a patient is from a MM’s area (see location lists up), please fill out a referral slip and place it in the MMs’ referral slip pockets in the maternity and paeds wards. On discharge, please fill in d/c date, your name, and any special instructions. You can select urgent (within 48hrs) or non-urgent (within 1 week) response. A mentor mother will collect the referral slips from the hospital on Mondays and Fridays. If there are any urgent patients that you would like to be assessed before they return home, please contact the MMs’ manager. (Funeka 060-3307764 or Safa 073-6696055)

- **YOU can refer patients from OPD and ARV’s by filling in a referral slip, and posting it in the referral sleeve in OPD and outside the ARV consulting rooms.** PLEASE CHECK that your patient comes from a MM area by consulting the location lists (available in consulting rooms). If you are unsure, rather refer and MMs can check the location of the patients.

- **Who are the mentor mothers:** The location lists have the names and contact details of the MMs and their supervisors. Contact them directly if there is anything urgent they need to know about a patient. The MMs also try to place a sticker with their name, area & contact number on their client’s RTHC or ANC cards. This makes it easier to determine which patients are already on the MM program.

- **MMZ are always on the LOOKOUT FOR GOOD MOMS!!** They try to select MM trainees who are known to be excellent mothers themselves (so-called “positive deviants”). If you spot a mom who strikes you as MM material, please take her name, LOCATION, & contact number, and pass on to the MM manager.

For all queries, speak to the MM manager, or visit them – their office is in the “Philani building” next to the community centre in the heart of the village.
Quick Reference – Useful Numbers in One Place

All these numbers occur elsewhere in the supplement with a more detailed description of how to refer to them, mostly in the Referrals section.

Emergency Medical Services

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMS</td>
<td>Ambulance</td>
<td>047-5315242</td>
</tr>
<tr>
<td>EMS</td>
<td>Ambulance</td>
<td>047-5324174</td>
</tr>
<tr>
<td>EMS</td>
<td>Ambulance</td>
<td>047-5323386</td>
</tr>
<tr>
<td>EMS</td>
<td>Ambulance</td>
<td>047-5323384</td>
</tr>
<tr>
<td>EMS</td>
<td>Helicopter Flight Desk</td>
<td>047-5312641</td>
</tr>
<tr>
<td>Mr Mashwabane</td>
<td>EMS OR Tambo District Manager</td>
<td>073-2084048</td>
</tr>
<tr>
<td>Mr Ndlwana</td>
<td>EMS Ngcwanguba coordinator</td>
<td>073-5503017</td>
</tr>
</tbody>
</table>

Helpful clinicians

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr Moeketsi*</td>
<td>Cardiology (adults)</td>
<td>071-9234127</td>
</tr>
<tr>
<td>Dr K Thomas*</td>
<td>Cardiology (adults)</td>
<td>083-3781264</td>
</tr>
<tr>
<td>Dr Tshabalala</td>
<td>Cardiology (paeds)</td>
<td>083-4755653</td>
</tr>
<tr>
<td>Dr Mankahla*</td>
<td>Dermatology</td>
<td>083-6547566</td>
</tr>
<tr>
<td>Prof Chooks</td>
<td>Endocrinology (adults)</td>
<td>071-4516355</td>
</tr>
<tr>
<td>Dr Malongwe</td>
<td>Endoscopy</td>
<td>073-1561715</td>
</tr>
<tr>
<td>Dr Mpikashe</td>
<td>Endoscopy</td>
<td>073-3981060</td>
</tr>
<tr>
<td>Dr Ibanez</td>
<td>Epilepsy (adults)</td>
<td>082-2007770</td>
</tr>
<tr>
<td>Dr Giyose</td>
<td>Gynaecology</td>
<td>073-6466152</td>
</tr>
<tr>
<td>Dr Qhata</td>
<td>Gynaecology</td>
<td>076-6469150</td>
</tr>
<tr>
<td>Prof Ogunsanwo</td>
<td>Haematology</td>
<td>084-3212482</td>
</tr>
<tr>
<td>Dr Opio</td>
<td>Maxillo-facial surgery</td>
<td>071-6410136</td>
</tr>
<tr>
<td>Dr Vasaikar</td>
<td>Microbiology</td>
<td>082-2021057</td>
</tr>
<tr>
<td>Dr Quvile</td>
<td>Neurology incl epilepsy (paeds)</td>
<td>076-1522007</td>
</tr>
<tr>
<td>Dr Mdaka</td>
<td>Obstetrics</td>
<td>082-4690644</td>
</tr>
<tr>
<td>Dr Pokhare1</td>
<td>Oncology Frere (EL)</td>
<td>083-3781078</td>
</tr>
<tr>
<td>Dr Jafta</td>
<td>Oncology NMAH</td>
<td>082-7733173</td>
</tr>
<tr>
<td>Dr Nxweni</td>
<td>Orthopaedics</td>
<td>063-4037094</td>
</tr>
<tr>
<td>Dr Mshumpela</td>
<td>Orthopaedics</td>
<td>083-3009098</td>
</tr>
<tr>
<td>Prof. Karaire-Mushabe</td>
<td>Paediatrics HOD</td>
<td>083-3780992</td>
</tr>
<tr>
<td>Paeds surgery EL</td>
<td>Paeds surgery EL on call Dr</td>
<td>083-3781061</td>
</tr>
<tr>
<td>Dr Kopol</td>
<td>Paeds surgery NMAH</td>
<td>083-4559773</td>
</tr>
<tr>
<td>Dr Sidondi</td>
<td>Plastics (incl burns)</td>
<td>072-6776889</td>
</tr>
<tr>
<td>Prof Zingela</td>
<td>Psychiatry</td>
<td>083-3780917</td>
</tr>
<tr>
<td>Ms Goliath</td>
<td>Psychology</td>
<td>084-3257572</td>
</tr>
<tr>
<td>Dr Matthews</td>
<td>Pulmonology (adults)</td>
<td>082-2007736</td>
</tr>
<tr>
<td>Dr Tau*</td>
<td>Pulmonology (adults)</td>
<td>083-9570115</td>
</tr>
<tr>
<td>Dr Gaire</td>
<td>Renal (paeds)</td>
<td>083-3780798</td>
</tr>
<tr>
<td>Prof Mashiyi</td>
<td>Renal (adults)</td>
<td>083-7031715</td>
</tr>
<tr>
<td>Prof Perez</td>
<td>Respiratory &amp; allergy (paeds)</td>
<td>082-2020984</td>
</tr>
<tr>
<td>Dr Dubula</td>
<td>Rheumatology</td>
<td>084-5570657</td>
</tr>
<tr>
<td>Dr Malaoa*</td>
<td>Surgery (adults, HOD)</td>
<td>083-3781410</td>
</tr>
<tr>
<td>Non-Mthatha consultants familiar with Zithulele who have offered advice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dr David Bishop</td>
<td>Anaesthetist (Edendale)</td>
<td>082-7897767</td>
</tr>
<tr>
<td>Dr Karen Fieggan</td>
<td>Geneticist (Red Cross)</td>
<td>083-2854707</td>
</tr>
<tr>
<td>Dr Dave Stead</td>
<td>Infectious Diseases (Frere)</td>
<td>084-4910884</td>
</tr>
<tr>
<td>Dr Andy Parrish</td>
<td>Internal Medicine (Frere)</td>
<td>082-5765930</td>
</tr>
<tr>
<td>Dr Lloyd Tooke</td>
<td>Neonatology (GSH)</td>
<td>083-4562575</td>
</tr>
<tr>
<td>Prof Hofmeyr</td>
<td>Obstetrics (East London)</td>
<td>082-2809402</td>
</tr>
<tr>
<td>Dr Mark Richards</td>
<td>Paediatrics</td>
<td>076-2966106</td>
</tr>
<tr>
<td>Prof Mike Levin</td>
<td>Paediatrics (esp allergy) (Red Cross)</td>
<td>082-4680989</td>
</tr>
<tr>
<td>Dr Harsha Lochan</td>
<td>Paeds Infectious Diseases (Frere)</td>
<td>072-5781217</td>
</tr>
<tr>
<td>Dr Muller</td>
<td>TB – MDR &amp; XDR (CMH)</td>
<td>074-1028137</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NMAH direct numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMAH switchboard</td>
</tr>
<tr>
<td>A&amp;E</td>
</tr>
<tr>
<td>A&amp;E</td>
</tr>
<tr>
<td>Bedford (ortho)</td>
</tr>
<tr>
<td>Endoscopy</td>
</tr>
<tr>
<td>ENT Clinic</td>
</tr>
<tr>
<td>Eye Clinic</td>
</tr>
<tr>
<td>GOPD</td>
</tr>
<tr>
<td>Labour ward</td>
</tr>
<tr>
<td>Mental health</td>
</tr>
<tr>
<td>MOPD</td>
</tr>
<tr>
<td>Neonatal High Care / ICU (Mthatha Regional)</td>
</tr>
<tr>
<td>POPD</td>
</tr>
<tr>
<td>Radiology</td>
</tr>
<tr>
<td>SOPD</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Blood bank</th>
</tr>
</thead>
<tbody>
<tr>
<td>SANBS Mthatha</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cecilia Makiwane Hosp</td>
</tr>
<tr>
<td>Frere Hospital switchboard</td>
</tr>
<tr>
<td>Groote Schuur paging service</td>
</tr>
<tr>
<td>Red Cross Children’s Hosp</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hotlines</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV Hotline</td>
</tr>
<tr>
<td>HIV Hotline “please call me”</td>
</tr>
<tr>
<td>Right to Care (Paeds HIV)</td>
</tr>
<tr>
<td>Vaccine Helpline</td>
</tr>
<tr>
<td>ECDOH Helpline</td>
</tr>
</tbody>
</table>
# NHLS

<table>
<thead>
<tr>
<th>Name</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nondyebo Maxhama (ZLE lab manager)</td>
<td>072-6289820</td>
</tr>
<tr>
<td>KK Ntshanga (ZLE technician)</td>
<td>082-6738702</td>
</tr>
<tr>
<td>Gcobisa Makaluzi (ZLE technician)</td>
<td>065-1507763</td>
</tr>
<tr>
<td>Nelisa Ndiki (ZLE reception)</td>
<td>082-6341690</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Department</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mthatha lab</td>
<td>047-5024181</td>
</tr>
<tr>
<td>Chemistry</td>
<td>047-5024895</td>
</tr>
<tr>
<td>Cytology</td>
<td>047-5024898</td>
</tr>
<tr>
<td>Genetics lab (chromosomes) Jhb</td>
<td>011-4898571/2</td>
</tr>
<tr>
<td>Genetics lab Jhb</td>
<td>011-4899223</td>
</tr>
<tr>
<td>Haematology</td>
<td>047-5024889</td>
</tr>
<tr>
<td>Histology</td>
<td>047-5024877/9</td>
</tr>
<tr>
<td>HIV Resistance lab Jhb</td>
<td>011-4898430</td>
</tr>
<tr>
<td>HIV Viral load lab Mthatha</td>
<td>047-5024953</td>
</tr>
<tr>
<td>Microbiology</td>
<td>047-5024919</td>
</tr>
<tr>
<td>TB cultures Mthatha</td>
<td>047-5024954</td>
</tr>
<tr>
<td>TB lab Port Elizabeth</td>
<td>041-3956170</td>
</tr>
</tbody>
</table>

# PHC Clinic contacts (* denotes clinic phone)

<table>
<thead>
<tr>
<th>Clinic</th>
<th>Contact Name</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jalamba</td>
<td>Sr Ncane</td>
<td>073-8440503</td>
</tr>
<tr>
<td>Koyana</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lutubeni</td>
<td>Sr Clock</td>
<td>061-6084848</td>
</tr>
<tr>
<td>Mapuzi</td>
<td>Mr Willie</td>
<td>082-2260389</td>
</tr>
<tr>
<td>Mqanduli</td>
<td>Sr Pato</td>
<td>087-3108028*</td>
</tr>
<tr>
<td>Ngcwanguba</td>
<td>Sr Zide</td>
<td>083-5392549</td>
</tr>
<tr>
<td>Nzulwini</td>
<td>Sr Sityebi</td>
<td>083-5903640</td>
</tr>
<tr>
<td>Pumalanga (ZLE gate)</td>
<td>Mr Cala</td>
<td>083-5070341</td>
</tr>
<tr>
<td>Tshezi</td>
<td>Mr Kratshi</td>
<td>083-3644150</td>
</tr>
<tr>
<td>Wilo</td>
<td>Sr Nombekela</td>
<td>078-1076652</td>
</tr>
<tr>
<td>Zidindi</td>
<td>Sr Nonkwelo</td>
<td>073-1602385</td>
</tr>
<tr>
<td>Ntlangaza</td>
<td>Sr Kama</td>
<td>084-9909035</td>
</tr>
</tbody>
</table>

# Other practical help

<table>
<thead>
<tr>
<th>Category</th>
<th>Name</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAF Case Manager</td>
<td>Mrs Moruri</td>
<td>083-5789738</td>
</tr>
<tr>
<td>Home Affairs Mqanduli</td>
<td>Mrs Mali</td>
<td>047-5731014</td>
</tr>
<tr>
<td>SASSA Mqanduli</td>
<td>Mr Dafi</td>
<td>073-3801197</td>
</tr>
<tr>
<td>SASSA Elliotdale</td>
<td>Office</td>
<td>047-5770370</td>
</tr>
<tr>
<td>Social Development Mqanduli</td>
<td>Office</td>
<td>047-5731020</td>
</tr>
<tr>
<td>Hospice care Mthatha</td>
<td>Mr Khaya</td>
<td>084-7037756</td>
</tr>
</tbody>
</table>

# Non-clinical Zithuleleans you may need to contact

<table>
<thead>
<tr>
<th>Name</th>
<th>Contact Title</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>John Young</td>
<td>JRHF General Manager</td>
<td>081-3701041</td>
</tr>
<tr>
<td>Cath Young</td>
<td>Operations (JRHF)</td>
<td>082-7750800</td>
</tr>
<tr>
<td>Chwayita Sogoni</td>
<td>HIV Programme (JRHF)</td>
<td>081-4881760</td>
</tr>
<tr>
<td>Amanda Mzamo</td>
<td>Rural Ability project (JRHF)</td>
<td>071-0258439</td>
</tr>
<tr>
<td>Sim Ngqelakhe</td>
<td>Rural Ability project (JRHF)</td>
<td>073-4765282</td>
</tr>
<tr>
<td>Funeka Dasoyi</td>
<td>Philani Mentor Mothers</td>
<td>060-3307764</td>
</tr>
</tbody>
</table>
Hospital Contact Details

The hospital’s contact details are as follows:

**Physical address**
Zithulele Village  
Mqanduli District  
E Cape  
5080

**Postal address**
P Bag X504  
Mqanduli  
5080

**Telephone**
+27 (0)47 573 8935

**Fax**
+27 (0)47 573 8942

**Website**
www.zithulele.org

**Practice number**
0018155

Acknowledgements

Thank you to the growing number of staff and colleagues who have contributed to this handbook over the various editions.

Zithulele staff who have made substantial contributions have been Dr Taryn Gaunt, Dr Sally le Roux, Dr Rebekah Kemp, Dr Elizabeth Gatley, Ms Kate Sherry, Ms Riana Dippenaar, Dr Karl le Roux, Dr Althea le Roux, Ms Dineo Lecheko, Dr Pierre-André Mans, Dr Bianca Moffett, Dr Jacques du Toit, Dr Nick Fine, Dr Hans Hendriks, Dr Kevin Pasio, Dr Squiggy Scotcher, Dr Lingesh Pillay, Ms Robyn Wates, Dr Suretha Cilliers and Drs Gareth and Nadisha Meyer.

Other contributors, including those who’ve made helpful suggestions include Dr Kim Rollinson, Dr Jo Withington, Dr Annelieke Collee, Dr Maartje Goudswart, Dr Madeleine Muller, Dr John Michell, Ms Shannon Morgan and Ms Laura Grobicki. Consultants who have kindly contributed to or reviewed topics include Dr Carol Hlela, Dr Lloyd Tooke, Prof Gerhard Theron, Prof Justus Hofmeyr, Dr Mike Levin. Some material has been adapted from guidelines produced by the Pietermaritzburg Hospital Complex and Helen Joseph and much has been taken from the NDOH electronic Clinical Guides. All are hereby acknowledged.

Disclaimer

While every effort has been made to make sure the information in this Handbook is accurate and up to date, it is the responsibility of the individual clinician to verify details, especially drug doses. Neither the contributors, nor the hospital, shall be liable for any adverse outcomes resulting from the use of the information presented here.